U. S. Circuit Court. Northern District of N.Y.

New Jersey Patent Company and) In Equity
National Phonograph Company) No. 7240
versus) on letters
Geo. G. Snowden, Jas. H.Snowden & Henry McSweeney doing) patent no.
business as a co-partnership) 713,209
... the Indestructible Phonographic Record Company)

TESTIMONY ON BEHALF OF DEFENDANTS;
DISCONTINUANCE

U. S. Circuit Court. Northern District of New York.

New Jersey Patent Company and National Phonograph Company versus George G. Snowden, James H. Snowden & Henry McSweeney doing business as a co-partnership under the name and style of the Indestructible Phonographic Record Company	In Equity No. 7240 on letters patent no. 713,209.

TESTIMONY ON BEHALF OF DEFENDANTS, ORDER AND
STIPULATION IN REFERENCE TO
DISCONTINUANCE

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UNITED STATES CIRCUIT COURT

NORTHERN DISTRICT OF NEW YORK.

New Jersey Patent Company
and
National Phonograph Company,
Complainants,

vs.

George G. Snowden, James H. Snowden and Henry McSweeney, doing business as a co-partnership under the name and style of the Indestructible Phonographic Record Company.
Defendants.

In Equity No. 7240
On Letters Patent No. 713,209.

Please take notice that the defendants herein will take the testimony of Brian F. Philpot of Brooklyn, New York, George G. Snowden of Indianapolis, Indiana, James H. Snowden of Indianapolis, Indiana, Henry McSweeney of Oil City, Pennsylvania, Henry W. Carter of Chicago, Illinois and others, each and all of whom reside more than one hundred miles from the place of trial herein and more than one hundred miles from any place at which the Circuit Court of the United States for the Northern District of New York is appointed to be held by law, at the final hearing for use on behalf of the defendants, before Annie C. Courtenay, a Notary Public in and for the County of Cook and State of Illinois, who is not of counsel nor interested in this cause, at the office of Sheridan, Wilkinson, Scott & Richmond, 1532 Marquette Building, Chicago, Illinois, on the 23rd day of May, 1910 at 11 o'clock A. M., and thereafter from day to day as the taking of the depositions may be adjourned; and such testimony will be so taken in accordance with the provisions of Sections 863, 864 and 865 of the Revised Statutes of the United States and the Equity Rules.

Sheridan Wilkinson Scott & Richa
for Defendants

To
Melville Church, Esq.,
McGill Building,
Washington, D. C.

Service acknowledged this 21st day of May, 1910.

Melville Church
Of Counsel for Comp

CIRCUIT COURT OF THE UNITED STATES,

NORTHERN DISTRICT OF NEW YORK.

New Jersey Patent Company and
National Phonograph Company,
Complainants.

vs.

George G. Snowden, James H.
Snowden and Henry McSweeney,
doing business as a co-partnership under the name and style of the
Indestructible Phonographic Record
Company,
Defendants.

In Equity, No. 7240,
On Letters Patent
No. 713,209.

Testimony taken on the part of defendants, before Annie C. Courtenay, Notary Public for the County of Cook and State of Illinois, at the offices of Messrs. Sheridan, Wilkinson, Scott & Richmond, 1532-35 Marquette Building, Chicago, Illinois, Monday, May 23, 1910, beginning at 11 o'clock A.M., pursuant to the annexed notice.

PRESENT: Thomas F. Sheridan, Esq., and Walter A. Scott, Esq for Defendants,

Melville Church, Esq., for Complainants.

BRIAN F. PHILPOT, a witness produced, sworn and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories propounded by Mr. Scott.

Q. 1. Please state your name, age, residence, and occupation?

A. Brian F. Philpot; fifty-two years; Brooklyn, New York. I am General Manager of the Indestructible Phonographic Record Company

Q. 2. Please state whether this is a corporation or co-partnership.

A. A co-partnership, consisting of George G. Snowden, James H. Snowden and Henry McSweeney.

Q. 3. What is the business of the Company you mention?

A. Manufacturers of phonographic cylinder records.

Q. 4. Were you ever connected with the phonographic business prior to your connection with the company mentioned, and, if so, with what Company?

A. I was. I was President of the Lambert Company from the time it was organized in 1900 until it went into bankruptcy.

Q. 5. Did you have any connection with the proceedings in bankruptcy which terminated the Lambert Company?

A. I was appointed Trustee for the creditors of the Lambert Company. I mean Trustee in bankruptcy.

Q. 6. What disposition was made of the assets of the Lambert Company?

Objected to as calling for secondary evidence.

A. They were sold to George G. Snowden.

Q. 7. State whether you, as Trustee in bankruptcy, sold the assets of the Lambert Company to Mr. George G. Snowden?

Objected to as not calling for the best evidence.

A. I personally conducted the negotiations with Mr. Snowden, personally received the payment from him for all the patents and assets of the Company, and signed the transfer, as Trustee, of all these assets to Mr. Snowden.

Q. 8. I hand you an instrument in writing, and ask you whether you can identify the signatures to the same and whether this instrument is one regularly executed and delivered by you?

A. I signed that instrument and delivered it to Mr. Snowden.

A copy of the instrument referred to in the preceding question and answer is here offered in evidence and designated "Defendants' Exhibit Philpot Assignment".

Except in so far as this instrument offered purports t be an assignment of Letters Patent, or rights thereunder, the same is objected to as secondary evidence, this objection being intended to apply particularly to the recitals in the preamble of the instrument.

It is stipulated that the copy introduced in evidence may have the same force and effect as the original would hav if introduced, the original to be produced hereafter if called for by the complainants.

Q. 9. I hand you a certified copy of the record of the bankruptcy proceedings which terminated the Lambert Company, also a certified copy of the final report of the Trustee in Bankruptcy, forming a part of said proceedings, and also a certified copy of the inventory of the Trustee in Bankruptcy, and ask you to examine these papers and state whether you are the Brian F. Philpot named therein, and whether said papers set forth the proceedings in bankruptcy as you remember them?

A. I am the Brian F. Philpot mentioned in these papers,and they are exact copies to the best of my knowledge and ~~belif~~ belief.

The papers referred to in the preceding question are introduced in evidence and designated, respectively, ~~in the order named in the question~~ "Defendants' Exhibit Record of Proceedings in Bankruptcy"; "Defendants' Exhibit Trustee' Inventory"; and "Defendants' Exhibit Report of Trustee".

Counsel for Complainants objects to the introduction of the papers enumerated in the offer last above named, on the ground that they are immaterial and irrelevant to any issue in this cause.

Q. 10. Upon the execution of the assignment to Mr. Snowden and upon the approval of your proceedings as Trustee by the Court,did you deliver to Mr. Snowden, and did he take possession of all of the assets of the Lambert Company, including Letters Patent, machine stock on hand, accounts receivable, the existing business of the Lambert Company, and any and all other assets of whatsoever nature belonging to said company?

Objected to, as calling for secondary evidence if the question is intended to cover the transfer of any property or assets, of any nature not enumerated in the instruments of transfer already offered in evidence.

A. I did deliver to Mr. Snowden everything described in your questic and he did take immediate possession thereof.

Q. 11. The certified copies of the proceedings in bankruptcy, including the Trustee's inventory and report, contain no mention so far as I can find, of the disposition of the assets of the Company to any one other than Mr. George G. Snowden. Have you an recollection of any of the assets being assigned to anyone other than Mr. Snowden?

A. Every asset of every kind and nature was transferred to Mr. Snowden, and nothing was sold to anyone else.

Answer objected to as irresponsive and volunteered.

Q. 12. Have you any personal knowledge as to whether Mr. Snowden after his purchase of the assets of the Lambert Company continued the business of that Company?

A. Yes, I personally represented Mr. Snowden in Chicago.

Q. 13. In what capacity did you represent him, as referred to by you?

A. In looking after the business with Beach & Beach and the running of the factory at No. 110 South Jefferson St., Chicago.

Q. 14. Will you state the nature of the business with Beach & Beach?

A. The manufacture and sale of cylinder phonograph records.

Q. 15. When did you first have business with Beach & Beach?

A. The Lambert Company made a contract for the business of selling a certain number of records annually to Beach & Beach in April 1904.

Q. 16. What was the nature of this business?

Objected to as immaterial and irrelevant. It is agreed that this objection may apply without repetition to all further questions in the same line of examination.

A. The Lambert Company agreed to deliver to Beach & Beach as many records as they should require for their business during a number of years.

Q. 17. Did this number of years extend beyond the date when the Lambert Company became a bankrupt and beyond the termination of the bankruptcy proceedings?

A. Yes, some years beyond.

Q. 18. I hand you two contracts, and ask whether they cover the transactions between Beach & Beach and the Lambert Company, as referred to by you above?

A. They do.

The contracts referred to are introduced in evidence as "Defendants' Exhibit Beach & Beach 1904 Contract," and "Beach & Beach 1905 Contract", respectively.

Objected to by counsel for complainants as irrelevant and immaterial, and as not properly proved.

It is stipulated that copies of the two contracts referred to may be substituted for the originals and have the same force and effect as the originals, the originals, however, to be produced at any time upon request of complainants, and the copies to be subject to all objections entered to the originals.

Q. 19. After Mr. Snowden took possession of the assets of the Lambert Company, and while you represented him, did he continue the performance of the Beach & Beach contract?

A. He did.

Q. 20. After Mr. Snowden took possession of the assets of the Lambert

Company, and while you represented him, state whether or not there was any interruption in the business of the Lambert Company, other than that caused by the financial difficulties which caused them to be adjudged a bankfupt?

A. There was not.

Q. 21. Do you still represent Mr. George G. Snowden personally in your present occupation, and, if not, whom do you represent?

A. While taking care of the business in Chicago for Mr. Snowden, Mr. James H. Snowden and Mr. Henry McSweeney became associated with him in the business, and I now represent the co-partnership, consisting of the three named, and have represented them continuousl from that time.

Q. 22. As I understand you, then, you were an officer of the Lambert Company, following which you were Trustee in bankruptcy for the Lambert Company, following which you represented Mr. George G. Snowden, purchaser of the assets of the Lambert Company, and then re resented the partnership which Mr. Snowden formed with James H. Snowden and Henry McSweeney, your connection with the business conducted by the Lambert Company being continuous from the time of your first connection with the company until the present: is this correct?

A. Yes.

Q. 23. State whether the entire assets and business as purchased by Mr. George G. Snowden from the Trustee in bankruptcy passed into the possession and control of the partnership known as the Indestruc ible Record Company ?

A. They did.

Q. 24. I hand you what purports to be a certified copy of a certificat setting forth that the true or real names of the persons who ar conducting the Indestructible Record Company are George G. Snowden, James H. Snowden, and Henry McSweeney, the correctness of this copy being certified by the Clerk of the County of Albany, State of New York. Will you please state whether you have eve seen the original of this document and what it was used for?

A. I have seen the original, and filed it for record in the County Clerk's office in Albany, New York, in order to comply with the requirements of the State of New York, which provide that when individuals are doing business under a company name, the names of the individuals comprising the company and their addresses shall be filed with the County Clerk.

Q. 25. Among the assets of the Lambert Company assigned to Mr. George G. Snowden, I notice there was a patent issued to W. F. Messer, No. 705,772, granted July 29, 1902. I hand you copy of this patent and ask whether the process set forth therein for making phonographic records is the one practiced by the Lambert Company during your connection with the Company?

A. Records were manufactured by the Lambert Company according to the patent spoken of from a time several months prior to the date of the patent up to the time of the sale of the patents and business to Mr. Snowden.

Q. 26. State whether the process carried on by Mr. George G. Snowden and by the Indestructible Phonographic Record Company differs materially from that set forth in the Messer patent 705,772?

A. In principle it is identically the same, with very slight modifications made merely for the purpose of increasing the speed and facility of manufacturing.

Q. 27. Can you make a sketch, or produce a sketch which you have already made, which will enable you to set forth such differences as there are between the mechanism now used and the Messer patent 705,772?

A. Yes.

Q. 28. Please produce the sketch and explain the difference?

A. Patent 705,772 shows a cut in the top plate with a vent leading through to the top thereof. This vent is for the purpose of catching the edge of the turn flange of the record blank and holding it securely while the celluloid blank is in process of expanding and driving out the air through the vent or opening n from between the matrix and celluloid blank. The vent 5 also holds the celluloid perfectly true against the space in the top plate between the vent 5 and the vent n, so that any inscription or lettering that may be put upon the top plate in this space will be perfectly reproduced in the celluloid. In our present process we have separated from the top plate that part between the vent 5 and n and made it a part of the equipment of the matrix, leaving the vent 5 in the same position and performing the same function as described in the patent, taking care at the same time to leave the vent n at the end of the matrix the same as described in the patent, The making of this change,permits the putting on this ring the name of the selection that is recorded in the matrix and does away with the necessity of having different top plates for each selection, as would be necessary if they were made exactly as shown in the patent. At the time the Lambert Company were making records they never used any support or backing for their records, but, as shown in the patent, turned the ends of the celluloid so as to leave a flange that would come down upon the phonograph mandrel. In our present process, after printing the record we cut off the bottom turned in end and insert backing into the record, and so in order to save material we did away with the long in-turned end at the base and made the vent 7 much closer to the matrix and knurled the base upon which matrix rests so as to give us the vent n',giving us thereby at all times the same vents,used in identically the same way as those shown in patent 705,772.

The sketch referred to by the witness in his last answer is introduced in evidence and designated "Defendants' Exhibit Philpot Sketch".

The certificate of partnership referred to in question and answer 24 is introduced in evidence and designated "Defendants' Exhibit Partnership Certificate".

Q. 29. State whether you now remember whether you executed,as Trustee in bankruptcy, any assignment to Mr. George G. Snowden other than that in evidence as "Defendants Exhibit Philpot Assignment"?

A. I do not remember having executed any other assignment

Q. 30. Please state whether you have made any effort to find such assignment, if executed?

A. I have not.

Q. 31. Please state whether you have searched or had others search the papers in your possession for the purpose of producing whatever might bear upon the assignment of the assets of the Lambert Company to Mr. George G. Snowden?

A. At the time of the completion of the sale, all the papers were turned over to him or his attorney, Mr. W. J. Breen, of Oil City, Pa., and I have not had any of them in my possession since.

It is ~~sti~~ hereby stipulated and agreed by and between the parties that uncertified printed Patent Office copies of patents referred to in the testimony of the witnesses for either side may be introduced in evidence with the same force and effect as would attach to certified copies of such patents. .

~~The patent to Messer No. 705,772 of July 26, 1902~~

Cross-Examination by Mr. Church.

X.Q. 32. When did the present partnership, consisting of George G. Snowden, James H. Snowden and Henry McSweeney, commence doing busines under the style of Indestructible Phonographic Record Company?

A. January, 1907.

X.Q.33. When did that partnership commence using matrices for reproducing phonograms under the Messer patent 705,772, as modified in accordance with "Defendants' Exhibit Philpot Sketch"?

A. To the best of my recollection in the early fall of 1907, ~~but~~

X.Q.34. And has that form of modified apparatus been used ever since by the firm?

A. It has.

X.Q.35. Of what are the matrices composed that are employed in the practice of the process of forming phonograms by the aforesaid modified Messer apparatus?

A. They are made of a very thin inner lining of gold, outside of which there is copper sufficiently thick to support the walls in our work. There is a brass ring soldered on both the top and the bottom, and a galvanized iron tube soldered to these rings,making a protecting wall for the copper matrix.. Another brass ring,fitt loosely in the matrix with a flange reaching out over the top ring to which it is screwed.

X.Q. 36. In the production of the thin gold lining to which you have referred, is there not first taken a wax master record having a phonographic record on its exterior and a deposit of gold made upon that wax master, after which this deposit of gold is backed with copper?

A. Yes.

X.Q.37. Is the deposit of gold on the wax master made in vacuum?

A. I don't know of my own knowledge.

X.Q.38. What is your best information on this subject?

A. That it is done that way.

X.Q.39. In the manufacture of phonograms by means of the modified Messer apparatus about which you have testified, what effect has the stea introduced upon the celluloid blank?

A. It softens it, or renders it pliable.

X.Q. 40.At how much pressure is that steam introduced into the mold?

A. At abour 45 pounds to the square inch.

X.Q.41. So the effect of the steam under pressure is not only to soften the celluloid blank, but to expand it or force it out against the gold lined matrix; is it not?

A. It is.

X.Q. 42.What is the object in introducing air under pressure into the mol what effect does it produce upon the blank?

A. It forces the celluloid more completely against the mold and holds it there until it is sufficiently cool to retain its shape.

X.Q.43. How is the blank separated from the gold-lined mold after it has been thus pressed into intimate contact with the mold?

A. It shrinks sufficiently to be removed longitudinally.

X.Q.44. Do you know from whose custody the instrument designated as "Defendants' Exhibit Philpot Assignment" was produced in order to be offered in evidence to-day?

A. I was told that it was from Mr. McSweeney.

X.Q.45. I will ask you if in the practice of making phonograms by the modified Messer apparatus which you have described, the following process is not practiced:

> "The process of duplicating cylindrical phonograms having a phonographic record thereon, which consists in depositing a metal on said phonogram to form a matrix or mold wherein the original record will be reproduced in relief, in inserting the continuous cylindrical blank to be reproduced within said matrix or mold, in expanding the blank into intimate engagement with the record in relief carried by the bore of said matrix or mold, the cylindrical blank being sufficiently thick to maintain its shape during and after the act of disengagement from the matrix, and finally removing the cylinder by direct longitudinal movement."?

By Mr. Scott:

As the question above set forth is simply a literal quotation of claim 9 of the patent in suit it is objected to as calling for an expression of opinion upon the precise question which the suit places before the Court for decision. Inasmuch as the witness has not qualified as a patent expert, and inasmuch as he has testified freely as to matters of fact, the question is further objected to as calling for an expression of opinion from a witness who has not been shown to construe the language of a patent, or to state whether or not any given state of fact comes within its terms.

A. That partially describes it.

X.Q.46. Is the description at all faulty and, if so, in what particular?

Objection repeated.

A. Our process consists in depositing metal on a wax phonogram to form a matrix or mold wherein the original record will be reproduced, ~~in relief~~ in inserting a continuous cylindrical blank with in-turned ends within said matrix or mold, placing said matrix or mold with the enclosed blank in the printing machine, so fitted with the bottom and top plate as to form a hermetically sealed chamber, except in the small vent in the center of top plate, this chamber consisting of the top plate, the bottom plate, and the celluloid blank; then introducing steam for the purpose of, first, softening the blank, and, second, for expanding it after being softened into contact with the mold, means being provided for allowing all the air between the blank and the matrix to escape without allowing any of the steam to get between the matrix and the mold, which, if it did, would ruin the record; then the air is introduced into this hermetically sealed chamber to complete the expanding of the celluloid against the matrix. If the steam were introduced without first forming the hermetically sealed chamber, the blank would collapse and no record could be produced. The blank is sufficiently thick to maintain its shape before and after the act of disengagement, but not during the act of printing, for the blank is held in shape during the act of printing by being caught in the vent in the plates at each end of the matrix. After the blank has sufficiently cooled and stiffened to retain its shape, we remove it by direct longitudinal movement.

X.Q.47. Are we to understand that you have been connected with and interested in the defendant firm since its formation?

A. I have been connected with the firm since its formation.

Brian F. Philpot

GEORGE G. SNOWDEN, a witness produced, sworn and examined on behalf of defendants, deposes and testifies as follows in answer to interrogatories propounded by Mr. Scott:

Q. 1. Please state your name, age, residence and occupation?

A. George G. Snowden; forty-four years; Indianapolis, Ind., formerly of Oil City, Pa. I am an oil producer.

Q. 2. Are you the George G. Snowden who figures in the bankruptcy proceedings of the Lambert Company, referred to in the deposition of Mr. Philpot, and are you one of the defendants in this suit?

A. I am.

Q. 3. Please state briefly the transactions which you had with the Lambert Company, or with Mr. B. F. Philpot, the Trustee in bankruptcy of that company?

A. About the spring of 1906 I came to Chicago and secured an option on all the patents and assets owned by the Lambert Company, the principal dealings being with Mr. Philpot, who represented the company, and I believe the Court in the bankruptcy proceedings, the Lambert Company being adjudged a bankrupt at that time. I finally purchased the property, secured the title to all the assets of the Lambert Company, and took possession of the same.

Q. 4. Was it your understanding at the time you made this purchase that you were to receive all of the assets of the Lambert Company, and did you in fact take possession of all of the assets, including its going business?

Objected to as leading and as calling for secondary evidence, the assignment and bill of sale given when the purchase was made being the best evidence of what the purchase covered.

A. It was certainly my understanding that I was to receive all the assets of the Lambert Company, and I received what I supposed to be a legal assignment of same and was assured by the attorney who represented the Lambert Company, Mr. Boyden , that my option covered not only all the patents of the Lambert Company, but all other assets of whatsoever kind or nature, including the going business, all personal property, bills receivable, Beach & Beach contract, and any equities or rights whatsoever the Lambert Company owned, including equities or rights growing out of the suit of the National Phonograph Company against the Lambert Company in the U. S. Circuit Court for the Northern District of Illinois.

Q. 5. I hand you an instrument which has been introduced in evidence as "Defendants' Exhibit Philpot Assignment", said assignment running to yourself and conveying the property of the Lambert Company, and ask you whether you are the George G. Snowden named therein and whether you have any recollection at the present time of any other assignment executed to you by Mr. Philpot, as Trustee of the Lambert Company, and also whether you have had any search made or mad any search yourself for the purpose of finding such other instrument?

A. This paper is the assignment I received at the time of paying the money for the patents and assets of the Lambert Company, and I hav made diligent search for any other possible assignment, and have failed to find any. I am the Mr. Snowden referred to in the assignment. I cannot recollect at this time whether there was any further assignment or not.

Q. 6. Did you in fact pay the purchase price for the assets of the Lambert Company, and did you in fact receive such assets, including its patents, accounts receivable, and existing business, and did you in fact continue such business.

Objected to as leading and as assuming what has not been proven.

The question is withdrawn.

Q.6. Please state whether the sale of the assets of the Lambert Company to you was consummated, and if so whether you paid the consideration and what was delivered to you therefor.

Objected to as leading, and as assuming.

A. The sale was consummated about July, 1906, and I received all the assets of the Lambert Company, including its going-business, which I continued, with Mr. Philpot in charge. I paid the consideration money.

Q. 7. I hand you two instruments in writing purporting to run from George G. Snowden, of Oil City, Pa., to James H. Snowden, of Indianapolis, Ind., and to H. McSweeney, of Oil City, Pa., respectively, and ask you whether you can identify the signatures of these instruments?

A. I can. They are each an assignment of one-third interest of the patents and assets acquired through my purchase from the Bankruptcy Court of the Lambert Company. It is my signature on each of the papers.

Q. 8. What was the purpose of assigning these interests to James H. Snowden and H. McSweeney?

A. That the three of us would own an undivided one-third interest in the business or copartnership.

Q. 9. Please state whether such a copartnership was actually formed and whether it now exists?

A. It was, the business being designated and known then as now as the Indestructible Phonographic Record Company.

Q. 10. Please state whether at the time you formed this copartnership you reserved as your personal property any of the assets which you acquired from Mr. Philpot, as Trustee for the Lambert Company, or whether all of such assets became partnership property and was subsequently used as such?

Objected to as leading.

A. I did not reserve any portion of the assets to myself or to anyone else, nor were they disposed of by me in any way before assigning the interests referred to.

The assignments referred to in Q. 7 and the answer thereto are introduced in evidence as "Defendants' Exhibit Assignment to James H. Snowden" and "Defendants' Exhibit

Assignment to H. McSweeney", respectively.

Objected to as immaterial and irrelevant.

It is stipulated between the parties that copies of these assignments may be substituted for the originals, the copies to have the same force and effect as the originals, to be subject to the same objections as the originals, and the originals to be produced at any time requested by complainants.

Q. 11. Please state whether after your purchase of the assets of the Lambert Company you continued the business of that Company, and whether that business was subsequently continued by the partnership to which you have referred?

Objected to as leading and assuming.

A. I did continue the business, and the partnership also continued it.

Cross-Examination by Mr. Church.

X.Q. 12. What if any connection has Mr. Brian F. Philpot with the defendant firm, Indestructible Phonographic Record Company?

A. He is the General Manager.

X.Q. 13. How long has he occupied that position?

A. Since the commencement of the firm.

X.Q. 14. Have any steps been taken to wind up the affairs of the Lambert Company, other than the bankruptcy proceedings to which you have referred?

A. We disposed of some of the personal property, including, I believe, boiler and engine, and some other tools and appliances and endeavored to collect some of the bills receivable, and did everything in our power to realize upon the assets not used or available for our business.

X.Q. 15. Has the charter of the Lambert Company been surrendered or vacated?

A. My attorney attended to all those matters, or I suppose he did.

X.Q. 16. You do not know, then, whether the charter of the Lambert Company has been surrendered or vacated?

A. Only by my attorney, Mr. Breen, telling me he had been very careful to see the record was all cleared up before he would pay the money.

X.Q. 17. So far as your personal knowledge goes, the Lambert Company, notwithstanding it has been through bankruptcy, may still be a subsisting corporation under the laws of the State of Illinois, with the right to do business - the business for which it was originally incorporated - within that State; am I not right?

A. Possibly you are correct, but I might add that I think the probabilities are that if the corporation did not pay its taxes required by law to the State that it would forfeit its rights to do business if proceeded against.

Re-Direct Examination by Mr. Scott.

R.D.Q. 18. I call your attention to direct question and the answer thereto It does not seem that you have answered the last clause of the ~~[illegible]~~ question, "or whether all such assets became partnership property and was subsequently used as such". Will you please reply to the question?

Objected to as leading, and also not as proper re-direct examination.

A. I received all the assets of the Lambert Company, including their patents and personal property, and turned all of said assets and personal property into the copartnership.

George G. Snowden

It is hereby stipulated and agreed that owing to the unpreparedness of Mr. Carter, defendants' expert witness, due to a death in his family, the further taking of testimony is adjourned, at the same place, to Wednesday, June 1, 1910, and the time for the closing of defendants' proofs is extended to June 10, 1910.

Chicago, June 1, 1910. Parties met pursuant to adjournment. Present as before.

HENRY W. CARTER, a witness produced, sworn and examined on behalf of defendants, deposes and testifies as follows in answer to questions by Mr. Scott:

Q. 1. Please state your name, age, residence and occupation?

A. Henry W. Carter; I am forty-three years of age, reside in Chicago, Illinois, and am a mechanical engineer, principally engaged in investigations leading up to the giving of my depositions as an expert witness in patent causes.

Q. 2. What experience and training have you had tending to qualify you to act as an expert witness in patent causes?

A. For the past twenty-five years I have been continuously engaged in mechanical studies and pursuits, and for the greater part of this time exclusively in these studies and pursuits in their relation to patents and inventions. My mechanical training began in the repair shop of the Washburn & Moen Manufacturing Company, Worcester, Mass., where I served an apprenticeship preliminary to entering the mechanical engineering course at the Polytechnic Institute in that city. I received my degree in 1886, and for three years thereafter worked as a practical machinist and draftsman with various machine companies. I then entered the examining corps of the United States Patent Office, where I was for several years continuously engaged in examining applications for patents and in passing upon their claims to determine their patentability in view of the prior art. Later I resigned to enter practice as a solicitor of patents and mechanical expert in all matters pertaining thereto, and am still engaged in such practice and have repeatedly testified as an expert witness in patent causes pending before the United States courts and the courts of this State. I have prepared many hundreds of applications

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for patents on all classes of mechanisms, and am thoroughly conversant with patent and machine specifications and drawings and with machinery in general. During my shop experience I learned the machinist's trade and was accustomed to operate all ordinary machine tools and became familiar with the general run of mechanical methods and processes. During a portion of the time that I was employed in the Patent Office I was obliged to make daily use of a graphophone in the ordinary course of my duties there, all correspondence emanating from that division being dictated to such machine, and in this way I came in contact and became familiar with phonographic devices and phonograms, to a process of making the latter of which I understand this controversy to relate. I have also been accustomed to use and observe such machines and devices occasionally ever since that time, and acted as an expert witness in the cases of National Phonograph Company vs. Lambert Company and Thomas J. Lambert, in Equity Nos. 25,788 and 25,789, and of National Phonograph Company vs. Lambert Company, in Equity No. 26,598, ~~lately pending~~ formerly pending in the Circuit Court of the United States for the Northern District of Illinois and subsequently in the United States Circuit Court of Appeals for the Seventh Circuit.

For these reasons I believe myself competent to act as an expert witness in causes generally involving patents for inventions on mechanical devices or processes of a mechanical nature.

Q. 3. Have you examined the patent to Edison here in suit, No. 713,20 of November 11, 1902, and do you understand the process of duplicating phonograms which this patent sets forth and claims?

A. Yes.

Q. 4. Have you read the deposition of Mr. Arthur S. Browne, complainants' expert witness, given in this case?

A. Yes.

Q. 5. Are you familiar with the process of manufacturing celluloid phonograms or phonographic records carried on by the defendant Indestructible Phonographic Record Company?

A. I am, except as to the exact nature of the method followed in making molds or matrices in which the celluloid phonograms are printed. I have visited the Company's factory at Albany, N.Y. and have carefully observed the processes carried on there, which include all of the steps involved in the manufacture of these cel loid phonograms after the molds or matrices have been provided. Where these molds come from, and just how they are made, I do not know. They are not made in the Albany factory - at least not in any part of it which I visited.

Q. 6. I hand you a certified copy of the transcript of record in the United States Circuit Court of Appeals for the Seventh Circuit in the suit of National Phonograph Company vs. Lambert Company, No. 1154, and ask you whether you are the Henry W. Carter whose deposition appears upon pages 145 to 237 thereof?

A. Yes, I am the same. This is the appeal record in the last case mentioned by me in my answer to Q. 2.

Q. 7. With regard to the matters of fact stated by you in that deposition, you may state whether or not these matters were true and were correctly stated by you at the time, and with regard to the opinions expressed by you in that deposition, you may state whether or not your opinion on the points involved remains the same as therein stated? Before answering this question you may first state whether or not you have recently read over this former deposition of yours.

A. I have read over this former deposition of mine within the last few days. The facts stated therein are true and were correctly stated by me at the time, and the opinions which I expressed therein are still my opinions. I see no reason for changing them in a substantial way.

Q. 8 I read from the record referred to, questions 4 to 10 of your direct examination with your answers thereto. You may state if you so testified and whether or not you wish at this time to add anything to your answers to these questions, considering them as now repeated. Your questions and answers referred to read as follows:

"Q. 4. Have you read the deposition of Frank L. Dyer,
"complainant's expert witness, and 'Complainant's Record on
"Motion for Preliminary Injunction'?

"A. I have read Mr. Dyer's deposition and a consider-
"able portion of the record relating to the injunction motion
"so that I have a general understanding of it.

"Q. 5. Are you familiar with the process of manufactur
"ing celluloid phonograms or phonographic records carried on
"by the defendant Lambert Company?

"A. I am.

"Q. 6. Please state briefly to what the Edison patent
"in suit relates, and what the process is which it discloses?

"A. The Edison patent sets forth a process of duplicat
"ing phonographic records or phonograms. These records, as
"is well known, are made originally by engraving a spiral or
"helical groove on a cylindric blank of wax or wax-like mater
"ial, by means of the machine known as the phonograph, or grap
"phone. The engraving tool of this machine is connected with
"a diaphragm designed to vibrate in accordance with the air
"vibrations or sound waves produced by the human voice or by
"a musical instrument, and the vibrations of the diaphragm
"being transferred to the engraving tool cause the spiral or
"helical line cut by the engraving tool in the wax cyl-
"inder to vary in depth at different points in accordance
"with the strength of the sound vibrations affecting the
"diaphragm at the moment. Then when the record thus cut is
" re-traced by a blunt pointed style attached to a diaphragm,
" the latter will be caused to vibrate in exactly the same

"manner as did the diaphragm to which the cutting style was af-"fixed, with the result of sending out new sound vibrations in "exact duplicate of the vibrations produced by the voice or musi-"cal instrument originally recorded.

"These original records are thus necessarily made of a " rather soft material, or wax, and are not durable. If repeated-"ly subjected to the action of the reproducing style the record "line or thread gradually changes its shape and loses its char-"acteristic indentations, so that the resulting sound becomes "fainter and fainter, and the softness of the material renders " it liable to be marred and the record surface to be destroyed "by the slightest accident or misuse in handling. Moreover, the "production of original records in this manner is a comparatively "and sometimes exceedingly expensive operation, and the number of "originals obtainable is frequently very limited, although the de-"mand for great numbers of the same record may be very large.

"It has,therefore,long been recognized as desirable that orig-"inal records produced by the engraving process should be copied "or duplicated in harder material by some process which would not "use up or destroy the original and which would enable the number "of duplicates to be multiplied indefinitely at small expense. "The Edison patent in suit sets forth one of the processes which "has been proposed for this purpose, although a crude one of "doubtful practicability, and one which has never been reduced to "a commercial basis, as I understand it, or, if so, to but a very "limited extent, having been abandoned even by the patentee in "favor of more satisfactory methods covered by other patents.

"In the carrying out of this Edison process a matrix is "formed having a cylindric bore of the diameter of the record to "be duplicated, and having upon the surface of this bore a negat-"ive duplicate in relief of the engraved record line or groove of "the original. The patent describes two methods of making such a "matrix, one of these methods being the familiar electrotyping "process, but also points out that 'the matrix can be obtained "in any other way familiar to those skilled in the art', which "is obviously true, since it will be apparent that the particu- "lar manner of forming the matrix can have no possible bearing "upon the subsequent operation of forming a duplicate record "within the matrix.

" A blank record cylinder having a tapered bore is then "fitted within the matrix, and a tapered mandrel is inserted "within the tapered bore of the blank. Then, to quote the pat- "ent (lines 30-46, p. 3):

> 'These parts are then subjected to heat, such as by being maintained in a heated atmosphere, whereby the blank will, by reason of its greater co-efficient of expansion than the matrix or mold, be expanded into intimate contact with the record surface of the latter and an impression of such record will be accurately received on the blank. When the blank has been thus expanded into engagement with the matrix or mold, the mandrel C is forced tightly within the blank, so as to further expand it mechanically, whereby the blank will be forced into ~~ba~~ absolute intimacy with the record, and an impression will be received on the blank which will be clear, sharp, and an absolutely faithful reproduction of the original record.'

"It now only remains to remove the blank safely from " the matrix. This is done by withdrawing the mandrel and cool- "ing the blank until it contracts radially sufficiently to be " drawn out endwise from the mold. The process is then complete, " and the new record cylinder thus produced will, in the contem- "plation of the patent, be an exact duplicate of the original " record from which the matrix was made, and can be used for pho- " nographic purposes in all respects as though it was the origin- " al record. Its durability and longevity, moreover, will be " greater than those of the original record, since the patent " points out that the material of which the duplicate record " cylinder is composed can be made much harder than that of " the original record, which must be soft enough to be satisfac- " torily engraved, indented, or cut by a phonographic recorder. " To quote the specification:-

"These blanks may therefore be made of a relatively

> hard material, such as asphalt, or of stearic acid or stearate of soda mixed with varying proportions of fine precipitates -- such as chalk, slaked lime, or lamp-black - or waxes or resins may be used, such as sealing-wax or shellac mixed with fine precipitates, like chalk or polished ebonite, vulcanized hard rubber, or celluloid may be used, or glue may be employed either alone or mixed with precipitates, such as chalk.'

"Q. 7. What is the object of heating the blank, or the matri
"and the blank, in this Edison process?

" A. The object of this step in the process is to cause
"the blank to force itself into intimate contact with the bore of
"the matrix, so as to take the impression of the latter, by its own
"expansive force. As the specification states, lines 18-27:

> " After the blank has thus been placed within the matrix or mold both the matrix and the blank contained therein are, or the blank alone is, brought to a higher temperature, whereby the blank will expand into intimate contact with the record surface of the matrix or mold, whereby the negative record thereof will be impressed with absolute accuracy upon the surface of the blank. * * * By making the blank of a materia having a higher co-efficient of expansion than the matrix or mold the blank will be properly expanded to receive the impression of the record, notwithstanding the fact that both the blank and the matrix or mold may be subjected to the same temperature.'

"And that this is the only object of the heating step of his proces
"is specifically stated by the patentee in his arguments made while
"his application was pending in the Patent Office, for the purpose
" of differentiating this process from analogous processes of the
"prior art cited against his claims. In these arguments and in cer
"tain affidavits filed in the Patent Office at the same time and fo
"the same purpose, the patentee strenuously distinguishes between
"this heating of the blank to cause it to take the imprint of the
"matrix by its own expansive force, and a heating of the blank dis-
"closed in some earlier processes, where the object was to soften
"the blank so that it would take the imprint of the matrix when
"subsequently forced into contact therewith by mechanical means,
"or by some other pressure than that due to its own expansion.
"Thus, in his argument accompanying the amendment, dated September

" 1, 1908, the patentee states:

> 'with the references the heating of the blank is performed for the purpose of making it plastic, so that the material of the blank may be afterwards displaced and caused to engage the mold by the action of a mandrel, while *with the Edison process the heating of the blank is performed solely for the purpose of causing it to expand into engagement with the matrix or mold.'* (The italics are my own.)

"Q. 8. Is it your understanding that this Edison patent "contemplates the possibility of making satisfactory reproductions "of phonograms without expanding the blank or forcing it into con- "tact with the matrix in any other way, or by any other means than "by its own expansive action, due to a heating of the ~~xxx~~ blank "alone, or of the blank and matrix?

"A. That is exactly my understanding of the Edison "specification, which states, as has been pointed out, that the "expansion of the blank by the heat alone will bring it into such "intimate contact with the record surface of the matrix or mold "that 'the negative surface thereof will be impressed with abso- "lute accuracy upon the surface of the blank.' The first and "fourteenth claims of the patent are particularly directed, appar- "ently, to this possibility of the process, and in the affidavit "of Charles N. Wurth, an assistant of the patentee, employed in "his laboratory in the experimental work connected with this pro- "cess, this affidavit having been filed with the amendment of Sep- " tember 1, 1898, it is stated that:

> 'I have made ~~xxxxxx~~ many records wherein the expansion of the mold was alone depended upon to secure the impression.'

" And it is further stated at the end of the same affidavit "that:

> 'The test of the difference between the two comparing with one of the prior art processes is that with the Edison process it is possible to effect a satisfactory, though not loud reproduction of the record by the use of heat alone, the expansion being sufficient to cause the blank to engage the record and result in an impression.'

"Q. 9. What, then, do you understand to be the object of
"the further expanding of the blank by the forcing in of the tape
"ing mandrel?

"A. The specification states that the forcing of the
"tapered mandrel into the blank, after the latter has been ex-
"panded into engagement with the record by heat, is to 'facili-
"tate the operation and make the resulting duplicate record some-
"what sharper.' (Lines 41-43, page 2). And the affidavit of
"Mr. Wurth, to which I have above called attention, points out
"that superior results are obtained in this manner. To quote
"the whole of his statement first above mentioned:

> 'I have made many records wherein the expansion of the mold was alone depended upon to secure the impression, but it is better to use a tapering mandrel, as Mr. Edison describes in his application, as by that use the resulting duplicates are perceptibly better than those obtained by the action of expansion alone.'

"The fact appears to be that the patentee contemplated the
"printing of the duplicate record surface primarily by the ex-
"pansion due to the heating of the blank, and secondarily, and
"as a further improvement tending towards more perfect results,
"by the expansion due to the tapered mandrel. In his argument,
"dated September 1, 1898, above referred to, Edison states that
" he

> 'uses in his preferred process two distinct expanding steps, one the result of heat and the other of mechanical pressure.'

"Q. 10. I note that certain of the claims of the Edison
"patent sued upon refer to the softening of the blank by heat.
"What foundation for this softening operation do you find in
"the application for his patent as originally filed?

"A. Edison's original application affords no support
"whatever for this statement, beyond the fact that it describes
"the blank as being heated to cause it to expand against the ma-
"trix. And, as above pointed out, the patentee, in his arguments
"and affidavits before the Patent Office, strenuously disclaims

"any other effect of the heating operation employed by him "than that of causing the blank to expand, and insisted that his "process was thereby distinguished from those processes of the "prior art in which the blank was heated for the purpose of "softening it. The degree of heat mentioned in the Wurth affi- "davit as employed in the Edison process, to-wit, 115°, is not "high enough to soften ebonite, hard rubber, or celluloid in "the least. As to the other materials mentioned in the Edison "specification, to-wit, asphalt, stearic acid or stearate of "soda, mixed with varying proportions of fine precipitates, such "as chalk, slake lime, or lamp-black, or waxes or resins, such "as sealing wax or shellac mixed with fine precipitates, the "description is too indefinite to enable any exact statement "of their softening points to be made, and with regard to these "I can only accept the patentee's argument and affidavits, to the "effect that the blank was not softened or rendered plastic by "the degree of heat applied. The hard soap records placed on "the market by the complainant company under its Edison patents "are not perceptibly softened, except by a temperature nearly or "quite double that mentioned by Wurth as employed in the process "of the patent in suit."

~~Objected to by counsel for complainant as incompeten and inadmissible, as leading, as calling for secondary and no primary or the best evidence, as embodying an attempt to run into this record fact evidence and opinion evidence taken in a cause to neither party to which are the defendants herein, or either of them, in privity.~~

A. I did so testify, and wish to be understood as so testifying now, assuming the questions to be repeated at this time. I have nothing at present to add to these answers, and know no reason for modifying th in any way .

Q. 9. Please answer the same question with regard to Q. 11 of your former deposition and your answer thereto, which I now read to you:--

"Q. 11. Please now briefly describe the prior state of "the art at the date of Edison's application, and particu- "larly those prior patents which you have stated were cited "by the Patent Office against Edison's claims, and from "which he attempted to differentiate, as above pointed out?

"A. The patents of the prior art cited by the Patent "Office against the application which resulted in the Edison pat"ent sued upon are as follows:

" U. S. patent to Edison, 484,582, October 18, 1892;
"U. S. patent to Edison 526,147, September 18, 1894; and
"English patent to Lioret, No. 23,366, of 1893; and
"English patent to Young, No. 1,478, of 1894.

"Of these patents Nos. 484,582 and 526,147 are of inter"est only in showing that Edison's preferred process of making "the matrix was patented by him more than two years prior to "the date of his application for the patent in suit, and as "showing also that the same identical matrix employed in the "patent in suit was disclosed by him at the same early date. "It is true that patent No. 484,582, which discloses the same "matrix, formed in the same manner, contemplates the subsequent "splitting of the matrix thus formed by a thin saw, so as to "make it separable, but obviously the matrix before being split "is the identical matrix which the patent in suit describes.

"It is, therefore, apparent that no novelty in the pro"cess of the patent in suit can be predicated upon the method "employed for forming the matrix, and in so far as this method "is detailed as a step in the patented process, it is surplusage "which might better be omitted. And this not only because of "its lack of novelty, but because, as the specification itself "points out , the matrix may be equally well made in any manner "known to those skilled in the art, it being obvious that the "particular method employed for making the matrix cannot pos"sibly affect in any way the steps subsequently required for "the formation of a duplicate record within such matrix.

"The British patents to Lioret and to Young also show "that it was old, more than two years prior to the filing of

"the application for the Edison patent in suit, to make matrice
"substantially identical with the matrix of the patent in suit,
"for the purpose of enabling duplicate records to be formed ther
"in. In the Lioret patent the matrix is described as a 'galvanc
"plastic' mold. In the Young patent the matrix is more specifi
"cally described as made by coating the original wax record with
"plumbago, or other conducting material, and then depositing cop
"per or other metal upon the coated surface by an electrical
"plating bath. This is , however, merely a longer way of des-
"cribing what Lioret calls a galvano-plastic mold. The process
"employed in both cases is the well-known electrotyping process
"referred to in the patent in suit as one method which may be
"employed to produce the matrix, it being the same, in fact,
"which defendant employs in making its matrices, as will later
"appear.

"The British patents, however, are particularly noticeable
"in that they also disclose, in my judgment, the complete pro-
"cess of the patent in suit, except, possibly, as this process
"may be regarded as limited to the impressing of a plastic rec-
"ord against a suitable matrix by its own expansive force. In
"both British patents the object of the process disclosed is the
"same as that of the Edison process, to-wit, the indefinite re-
"production of phonographic records in exact duplicate of an
"original record. In both the British patents a cylindric ma-
"trix is employed, having upon its bore the negative duplicate
"in relief of the original record thread or line, just as in the
"Edison patent in suit. In both British patents a hollow cylin-
"der or sleeve of celluloid, approximately fitting the bore of
"the matrix is inserted therein and subjected to heat and press-
"ure to cause it to take the imprint of the record line on the
"surface of the bore, as in the patent in suit; and in both
"British patents the celluloid sleeve or blank is finally

"cooled to free it from the mold or matrix and enable it to "be moved endwise therefrom.

"Lioret's description of these duplicate records and the "manner in which he makes them is as follows: (lines 9-25, p.7):

> 'They may be made of celluloid; this material presents the advantage of keeping impressions well, of not being liable to break, and above all of not being materially affec ed by atmospheric variations.
>
> 'Furthermore, although very homogeneous and hard, it cuts and molds sharply and wears away very slowly.
>
> 'The following is the method of operation: The matri cylinder a (Fig. 4) is prepared as I have above indicated, then, as shown in Fig. 5, I take a galvano-plastic mold a^1, which consequently presents the form of a tube bearing on its inner surface the counterpart of the screw-thread and of the impressions of the matrix cylinder a (Fig. 6) Then into this tube is introduced a celluloid sleeve c (Fi 7) just big enough to enter same freely, and the whole is plunged into warm water; the celluloid then softens and a mandrel a^2 sufficiently large to expand it and cause the material to penetrate into the hollows of the tube is forced therein (Fig. 8). It is then plunged into cold water, and the celluloid again hardens it, at the same time contracting sufficiently to enable the sleeve c to be easily withdrawn from the tube a^1. This sleeve thus finally becomes a reproduction cylinder c, which is the exact reproduction of the matrix cylinder a.'

"Now, bearing in mind that the 'matrix cylinder' of "this quotation is simply the original cylindric record or phonogram, about which the matrix or mold is formed, and bearing in "mind also that the mandrel referred to is shown in Lioret's dra "ings (Fig. 8) as a tapered mandrel, it will be noted that the "quotation is about as accurate a description of the Edison patent in suit as it is possible to frame, omitting Edison's reference to the impressing of the blank against the matrix by its "own expansive force, and to the use of hot air, instead of hot "water, as his heating medium.

"The Young patent, after describing in detail the method "of forming a matrix (which he calls an 'electro') by electrotyping an original wax record cylinder engraved with the recording stylus in the usual way, proceeds as follows:

> 'To produce a working record from the said electro, this and its case would be warmed or slightly heated by any convenient means, and within the said electro would then be placed a very thin hollow cylinder, of the same size [illegible]

ternally as that of the original wax cylinder from which the record was first taken. The said thin cylinder may be made of any suitable material capable of being rendered plastic by the application of a gentle heat, such, for instance, as celluloid, xylonite, vulcanite, or the like, and having a highly polished or perfectly smooth external surface, and when this has been rendered pliable, by a gentle heat (which may be that given off from the heated electro and its casing) I press the same gently and evenly up to and against the face of the electro, and take an exact impression therefrom, and when the said plastic cylinder has cooled, I am enabled, by slightly collapsing this inwardly, to cleanly and easily remove it from the electro, when I am in possession of an exact duplicate of the original record and all its delicate details which I then mount upon the same or a like base as that from which the original record was removed, and the same may then be placed upon the machine and used for reproducing in the same manner as could and would have ~~thx~~ been the original wax record.'

" This also will be recognized as a substantially accurate "description of the Edison process, omitting the reference to "the impressing of the blank against the matrix by its own ex- "pansive force. The quotation does not use the words 'shrinkage' "or 'shrinking', but speaks of cooling the blank and collapsing "it inwardly to release it from the mold, and it is evident that "the collapsing referred to is simply a clumsy statement of the "contradiction which necessarily results from the cooling of the "celluloid and inevitably draws it inwardly away from the surfac " of the bore of the matrix, so that it can be removed endwise "therefrom."

~~Objection to Q. 8 repeated.~~

Adjourned until June 2, , 1910 at ten o'clock A.M.

Chicago, June 2, , 1910. Parties met pursuant to adjournment. Present as before.

A. I did so testify, and wish to be understood as so testifying now, assuming the question to be repeated at this time.

I would, however, like to add to this answer a reference to certain prior patents, illustrative of the general state of the art at or before the time of the alleged invention of the patent in suit, which were not referred to in the Patent Office discussion had with reference to this alleged invention.

EDISON PATENT No. 382,417, May 8, 1888: This patent shows that it was old at the time to make phonogram blanks by a method ~~notably~~ noticeably similar to that which the patent in suit sets forth.

Looking at Fig. 3 of the drawing of this patent, it will be understood that F is a cylindric mold or matrix bored out to an interior diameter approximately equal to the diameter of the desired blank. The unlettered part fitting within this matrix is a wax blank previously moulded to approximately the required shape and inserted in the matrix while still warm. The part lettered G is a tapering plunger or mandrel, which is forced down by the screw H so as to expand the wax blank into intimate contact with the surrounding wall of the matrix. As soon as the expanding operation is completed, the mandrel or plunger B is removed, leaving the blank free to be withdrawn from the die and used on the phonograph without further treatment.

This patent does not state that the contraction of the blank, due to cooling, loosens it in the matrix and permits it to be readily withdrawn, but of course this would be the natural and normal action, the blank having been inserted while warm. Materials which do not contract on cooling are very rare, and the materials ordinarily used for forming phonographic blanks are not among them. Moreover, this patent directly refers to the contraction of the blank due to cooling, in describing the prior step of molding the blank, although it does not happen to refer to it in connection with the finishing of the blank in the matrix or so-called die F. Thus the specification states, with regard to the molding process (lines 57-62) that -

> "When the wax is partially cooled, sufficiently so to retain its shape, the mold is swung to the right over the opening D and the core E is pushed down into the opening A, as shown in Fig. 2, *thus permitting the wax to contract without breaking.*" (italics mine).

The subsequent steps of finishing the blank in the matrix or die, to which I am particularly directing attention, are described in the specification, beginning at line 62, as follows:

> "After the cylindrical blank has cooled down to a temperature where it is *still slightly plastic* - say 100° Fahrenhe it is removed from the mold and is placed in the die F. *This die may be* a divided die or *one that is solid.* It has a cylindrical opening with a shoulder, *a*, at its lower end. A tapering plunger, G, pressed forward by a screw, H, is forced into the bore of the phonogram-blank, *pressing the blank against the walls of the surrounding die, and giving it the exact shape* and size both externally and internally that it is desired the blank should have. The die and its plunger are made of highly-polished metal. Speculum metal is preferably used for this purpose. The plunger is then removed from the blank and the blank removed from the die, when it will be ready for use on a phonograph. The blank formed in this way is accurate in its size and has a highly-polished recording surface, which improves the articulation of the phonograph, and also has its bore accurately tapered, so as to fit the cylindrical phonogram-carrier of the phonograph." (Italics mine)

Omitting from consideration the feature of bringing the blank into intimate contact with the surrounding surface of the matrix by reason of its own exap expansive force, due to heating, it will be obvious that the process followed in finishing the phonogram in the patent in suit involves precisely the same steps which are followed in finishing the phonogram blank in this prior Edison patent No. 382,417. In each case a previously molded cylindric blank is placed in a previously formed cylindric matrix, and is expanded while in a warm and plastic condition into intimate contact with the interior surface of the matrix by the forcible introduction of a tapered mandrel into the blank. In each case the withdrawing of the mandrel and the cooling of the blank permits it to contract and free itself from the wall of the matrix, and in each case the blank is subsequently withdrawn from the matrix "by direct longitudinal movement". Of course the prior Edison patent No. 382,417 does not point out in words that the blank is withdrawn by direct longitudinal movement, but this inevitably follows if the die or matrix is made solid, as the patent states that it may be, ~~for instance,~~(line 67). This is the ordinary way of pulling any piece or core out of a hole in a solid container, and naturally is not ordinarily described in detail by reason of its very obviousness. It was not so described in the patent in suit as originally written, but this reference to "direct longitudinal movement" was introduced by amendment in the attempt to distinguish between the manipulations followed in the patent in suit and those assumed to be necessary in the case of the Lioret patent. The distinction is believed to be an absurd one in any case, but in this comparison with the prior Edison patent 382,417 it may be ignored as nonexistant, since the blank of this prior patent must be, as stated, withdrawn by "direct longitudinal movement".

It therefore follows that the only real difference between the procedure of the patent in suit (again omitting the feature of printing the blank by its own expansive force due to heating) and the procedure of this prior Edison patent No. 382,417 in respect to the finishing of its phonogram blank, lies in the characof the matrix used. In his patent No. 384,417 Edison wished to produce a smooth surfaced blank ready for use on a phonograp to receive an original record from the cutting stylus of the machine, and he accordingly selected a matrix with a smoothed and polished bore. In his patent in suit, Edison wished to produc a duplicate of some original record, and accordingly selected a matrix having on its interior the infinitesimal thread-like negative of that original record. Assuming the selection of the proper matrix, the subsequent steps were the same in the two cases, and the difference in the product was wholly due to the difference in the matrix.

Years prior to the patent in suit, Edison himself, in hi patent No. 484,582, of 1892, and Young, in the British patent t Young, had made public the method of making the matrix having the negative of a phonographic record engraved on its interior, so that this instrumentality, as well as the smooth bored matri was ready at hand for selection. And as a matter of fact the difference between a smooth bored matrix and one bearing a record negative on its interior surface is so infinitesimal that it needs rather a close examination to distinguish between them. They look nearly alike, and are almost identical to the feeling, the indentations in the record matrix being so minute that their depth can be expressed only in ten thousandths of an inch - an almost inconceivably small dimension - perhaps the one-fiftieth part of the diameter of a hair from the human head. And while the difference involved between the two matrices is vital, so far as sound reproduction is concerned, it remains infinitesimal so far as the methods of these two patents are concerned. For it is not because of but in spite of the difference which exists between the interior surfac of the two matrices that the method followed in making the smoot blank according to patent 382,417, may also be followed in making the duplicate phonogram,according to the patent in suit. It is because the roughnesses of the record matrix are still too slight to interfere with the absolute intimacy of contact produced by the expansion of the plastic blank by the driving in of the tapered mandrel, and are still too slight to prevent the inevitable contraction which the blank undergoes when it cools, from sufficing to free the surface of the blank from the surface of the matri which enables the same method to be followed in producing the duplicate phonogram which was previously followed in producing the smooth blank.

Much has been said in these discussions with regard to the "enormous complexity of the phonographic record and the excessively delicate character of its surface", to quote Mr. Frank L. Dyer, complainants' former expert witness, but logically considered all such talk is beside the point. For the real point is that the possibility following the process of the patent in suit is due, not to this complexity and delicacy of the record, but to the fact that notwithstanding such complexity and delicacy the record surface is still so essentially and approximately a smooth surface, by reason of the infinitesimal character of its surface variations that the same old method which was previously followed for the production of the smooth surfaced blank could still be followed for the production of the duplicate phonogram.

And the fact is further that in his so-called step of releasing the phonogram from the mold by the contraction due to its cooling, the patentee is doing nothing over which he has any control,or with regard to which he possesses the power to decide whether or not this so-called step shall be followed. On the contrary he is simply recognizing an inevitable phenomenon of ordinary molding operations - the shrinking of the molded part due to its cooling - simply taking advantage of this phenomenon just as it has always been taken advantage of throughout the mechanic arts, whenever the possibility or desirability of casting or forming an article within a non-sectional mold has presented itself. As a pertinent example of this fact I would refer to the patents to Appelt, No. 303,970, August 26, 1884; Potter No. 434,294, August 12, 1890; and Day, No. 563,572, July 7, 1896.

The Appelt patent, referred to, relates to the covering of drawing rollers, such as are employed in spinning machinery, with a compound of gelatine and glycerine, intended to form a substitute for the leather or India-rubber said to be usually employed for this purpose. The covering compound is cast about the spindle of the roller in a tubular mold, the patent states, at line 89, page 1, that -

> "As soon as the compound has congealed the tube a, with the roller, is removed, the key d is withdrawn, when the roller will easily come out of the tube a in consequence of the shrinkage which all compounds composed principally of gelatine and of glycerine undergo". (Italics mine).

In the Potter patent "2 represents a mold which is preferably made of a single cast piece of metal having a mold cavity 3, whose internal shape conforms to the article to be produced". The specification, at line 96, states that by -

> "allowing the metal to cool sufficiently to shrink loose from the mold it may be removed or ejected in any suitable way."

The Day patent shows a mold for casting printers' rollers, which is particularly illustrated in its Figs. 1 and 2. With regard to the use of this mold the patent states, at line 72, page 1, that -

> "In the manufacture of these rolls I may employ the ordinary roller composition, which is poured into the molds after the surfaces with which the composition con-

tacts are thoroughly oiled. As soon as the composition cools and becomes jellied I remove the mold from the base and withdraw the inner tube D and allow cool air to circulate through the interior of the mold, thereby drying the tubular roller, causing it to shrink at the inner surface and withdraw itself from the outer tube C, when it may be removed from the said tube and mounted in a manner presently to be described."

Q. 10. Please answer the same question with regard to Q. 12, of your former deposition, and your answer thereto, which I now read to you:

"Q. 12. Do I understand that these British patents to "Young and Lioret are the prior patents from which the patentee "attempted to differentiate by argument and affidavit while his "application was pending? If so, will you kindly explain more "fully the nature of the distinction which the patentee asserted to exist between his process and the processes disclosed "in these British Patents.

"A. These are the same prior patents discussed in the "arguments and affidavits referred to. In distinguishing from "these patents Edison first alleged, as has been before stated, "that in these British patents the heating of the blank is effected solely for the purpose of softening it; while in his "process the heating of the blank is solely for the purpose "of causing it to expand against the mold. This is repeated "over and over in most emphatic language, to some of which "reference has already been made. Thus, in the argument "dated July 6, 1898, it is stated that -

> 'The heating of the blank as described by Lioret is effected solely for the purpose of making it soft in order that the mass may be displaced, so to speak, and be forced into the record contained at the bottom of the groove in the mold. With applicant's process the blank is heated for the sole purpose of causing it to expand and [illegible] tightly with the record formed in the mold. Since [illegible]

> cylindrical molds and blanks are used, the latter may be fitted within the mold within .002 [two one-thousandths] of an inch, so that the proper expansion of the blank may be secured *without appreciably affecting the hardness and brittleness thereof.'* (These latter italics are my own).

Also that -

> ' The second British patent [the Young patent] makes it very clear that in the process described thereby, as well as in that invented by Lioret, the heating of the blank is performed solely for the purpose of making it plastic."

And finally that -

> "It being the fact, therefore, that in neither of the references to which the Examiner directs applicant's attention is the heating of the blank effected for the purpose of expanding the blank into contact with the record, but is done solely for the purpose of making the blank plastic to enable it to be displaced and forced into contact with the record, it is clear to applicant that neither of the references is an anticipation of his invention.'

Also quoting further from the Wurth affidavit, accompanying Edison's amendment of September 1, 1898:

> 'In carrying out the Edison process, I usually heat the blank after it has been inserted in the mold to a temperatur of about 115° Fahrhenheit, but this, of course, depends largly upon the character of the material of which the blank is made. *This heating does not in any way affect the brittleness of the blank, nor does it make the blank plastic.'* (These italics are my own.)

And again -

> 'I have found that it is impracticable to heat a blank to the plastic point after its introduction into the mold, and particularly if the record is deep, as is obviously the case with a mold of the Lioret type having a record formed at the bottom of screw-threads, for the reason that when heated to plasticity, the blank will inevitably stick to the mold and it will in consequence be impossible to obtain a perfect record. When, on the contrary, the blank is heated well below the point of plasticity, as in the Edison process, and does not lose its friability, no difficulty of this kind has ever arisen.'

And again -

> 'The Young patent does not state how the blank is to be engaged with the mold, but assuming that it could be evenly, accurately and simultaneously engaged with all parts of the record, it would be possible to obtain a duplicate as described. It would not, however, be possible to remove the duplicate after it was obtained, since the heating of the blank to the point of plasticity would inevitably cause it to stick to the mold and thereby injure the record in whole or part.'

And finally --

> 'The essential difference between the Lioret and Young processes and the Edison process is that in the former the heating is effected for the purpose of making the blank plastic, so as to allow the material thereof to be distorted or displaced by the introduction of the mandrel. *With the Edison process*, the heating is done for the purpose of *expanding the blank* into engagement with the record, *and does not affect the brittleness of the blank.* The test of the difference between the two is that with the Edison process it is possible to effect a satisfactory, though not loud, reproduction of the record by the use of the heat alone, the expansion being sufficient to cause the blank to engage the record and result in an impression. With the Lioret and Young processes, this would not be possible, since the heating is always a necessary precedent to the subsequent displacement of the material by the use of a mandrel.' (The italics are my own)

"Mr. Edison himself also executed an affidavit on
"the same date as the Wurth affidavit, and which was filed
"with the same amendment of September 1, 1898. In this af-
"fidavit he says:

> 'I have read the affidavit signed and executed by my assistant, Mr. Charles N. Wurth, on even date herewith. The statements made by Mr. Wurth in reference to his experiments connected with my process and his criticisms of the processes described in the Lioret and Young patents are true, to the best of my knowledge and belief.'

" And quoting also from the amendment accompanying these
"two affidavits -

> 'The Lioret and Young processes are different from that which Mr. Edison has invented, and particularly in the respect that with the references the heating of the blank is performed for the purpose of making it plastic so that the material of the blank may be afterwards displaced and caused to engage the mold by the action of a mandrel, while with the Edison process the heating of the blank *is performed solely for the purpose of causing it to expand into engagement with the matrix or mold.'* (The italics are my own).

"And again -

> 'The claims which have been erased are cancelled in view of the fact that they appear to cover processes which are broader than applicant's invention, namely, processes wherein the blank , in the process of duplication, is displaced instead of being expanded. Neither the present first nor second claims is met by the references, *for the reason that in the references the blank is not engaged with the mold by a change in temperature.* In both the references, the heating of the blank is, as stated, performed for the purpose of making the blank plastic, and the engagement is subseqrently effected by mechanical means. (The italics are my own)

"Again in the argument accompanying the amendment of "September 7, 1899, it is stated that -

> 'It is to be noted that they [the Young and Lioret patents] do not meet the terms of the rejected claims, since with both references the blanks are heated to the point of plasticity, and the engagement with the mold is effected by actually displacing the material of which the blank is formed. This is not the equivalent of applicant's step of expanding the blank into engagement with the mold, the blank being heated below the point of plasticity necessarily, because otherwise it would stick to the mold and would destroy the record if an attempt were made to withdraw it.' (The italics are my own.)

"These quotations from the file-wrapper of the Edison pat- "ent show the gist of the inventor's argument as to the difference "between heating the blank to soften it, with a view to subse- "quently forcing the softened material against the record sur- "face of the bore of the matrix, as in the Lioret and Young pro- "cesses, and heating the blank to a degree insufficient to soften "it, or to appreciably affect its hardness or brittleness, but "enough to cause it to intimately engage the bore of the matrix "by its own expansive force. At this time the patentee was evi- "dently laboring under the impression that the heating of the "blank until softened so that it would take the impression of "the bore when subsequently forced out against it, as in the Lioret "and Young processes, would cause it to stick to the surface of "the bore so as to prevent its removal without damaging the record. "And this may have been true with the soap or wax records, with "which alone Edison appears to have been familiar at the date of "his application. But it was not true with celluloid records, such "as those of the Young and Lioret patents, and such as those manu- "factured by defendant, as will presently appear. The fact ap- "pears to have been that Edison had never made a celluloid record "when he applied for the patent in suit. His testimony in the "interference Lambert vs. Edison, a copy of the record in which "has been filed in this case by complainant, is to the effect "that he first made a celluloid record in the year 1899. This "testimony, dated February 21, 1901, is as follows:

> '25 X.Q. Did you ever make any celluloid records, Mr. Edison?
>
> 'A. I have lately.
>
> '26 X.Q. When did you first make a celluloid record?
>
> '. I don't remember; I think, perhaps, about a year or a year and a half ago.' (Edison's Record p.9.)

"This would bring his first making of a celluloid record at "least a year later than the date of filing of his application for "the patent in suit, and evidently at that filing date he knew "nothing of celluloid records or their characteristics, or the "manner in which celluloid would act under the circumstances of "a process such as Lioret or Young describes. His naming of cellu-"loid in his specification as one of the materials which might "be employed in his process was thus manifestly simply a blind at-"tempt to extend the scope of his alleged invention to include mater-"ials of the adaptability of which to his process he had no knowledge " and which have ~~xh~~ subsequently been proved to be incapable of "working in accordance with the process which he at that time dis-"closed. For the fact is, as will subsequently be shown, that cel-"luloid is incapable of being impressed with the record surface of "the bore of the matrix unless first softened or rendered plastic "after some such manner as that described in the Lioret and Young "patents, and unless forced out against the bore of the matrix by a "high degree of pressure applied independently of and in addition "to any pressure which may result from the force of its own expans-"ion. And the fact is, further, that when so softened or rendered "plastic and forced out against the bore of the matrix, the cellu-"loid will not stick to the surface of the bore, but will inevitably "cleave away from it by its own natural shrinkage when cooled, and "this no matter how thin the sheet of celluloid may be of which the "cylindric phonogram blank is composed.

"In addition to distinguishing his process from the Lioret "and Young patents by the difference in the character of the heat-"ing and in the effect of the heating upon the blank, the patentee "also contends in these same arguments and affidavits that the "Lioret process is inoperative because of the impossibility of "separating the galvano-plastic mold or matrix from the original "record cylinder used by Lioret, and because the immersion of the "mold and blank in hot water to soften the celluloid would cause "the water to penetrate between the mold and blank, where it could "not be displaced by the driving in of the mandrel, and where it would consequently prevent the formation of a perfect imprint of "the record indentations. Also that the process of the Young patent contemplates a collapsing of the record cylinder, whereby its "cylindric shape would be destroyed, so that it could not be restored without damaging the record irreparably.

"And subsequently it was contended that the Edison process "was distinguished from the Lioret process, in that in the latter "the printed blank required to be unscrewed from the mold after "cooling and contracting, whereas the Edison blank could be removed 'by direct longitudinal movemnet,' and was distinguished from "the Young process in that the printed record was contracted away "from the matrix by its own shrinkage, due to cooling, instead of "being collapsed. Also that the Edison process was distinguished "from the Young process in employing a blank 'sufficiently thick to "maintain its shape during and after the act of disengagement from "the matrix'. And all of these distinctions have been embodied in "the claims of the patent in suit, to a greater or less extent, as "will appear from an examination of the claims sued on."

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, assuming the question to be repeated at this time.

Adjourned until Friday, June 3, , 1910, at ten o'clock A.M.

Chicago, June 3, , 1910. Parties met pursuant to adjournment. Present as before.

Q. 11. Please answer the same question with regard to questions 13, 14, 15, 16 and 17, and your answers thereto, which I now read to you:

"Q. 13. Please state to what extent these distinctions "contended for by the patentee as differentiating his process "from the Lioret and Young patents are material and valid?

"A. As to the first distinction, so strenuously in- "sisted upon, that the heating of the blank in the Edison "process does not soften the blank or materially affect it "hardness, brittleness, or friability, but operates solely to "cause the blank to take the impression of the mold 'by its "own expansive force,' whereas the heating contemplated by "the Lioret and Young patent operates solely to soften the "blank and render it plastic so that it will readily conform "to the record surface of the mold when subsequently forced "against it by pressure otherwise applied, I have no criticis "to offer. It is obvious that a celluloid record could not "be 'printed,' to use the trade term, unless it were so softe "ed, and that neither the Lioret nor Young patents contemplate "a process in which such softening does not occur. A wax or "soap record may perhaps be printed without softening it and "by its own expansive force, and in this respect the Edison "process appears to be possibly distinguished from the pro- "cesses of Lioret and Young, as the patentee contends.

"The objection that the Lioret process is inoperativ "because of the alleged difficulty of separating the galvano- "plastic mold is perhaps best stated in the words of Mr. Wurth "affidavit:

'In the Lioret process as described by the inventor an original record is first taken on a soft steel cylinder, the record being cut on the top of a screw-threaded form in the periphery of the cylinder. It is possible to do this, as I have made such records myself. The original record thus obtained by Lioret is then electro-plated, the electroplating being sufficient to form a mold of the desired body, no backing, so-called, being described by him. This is, of course, possible. The patentee then says (p. 2, lines 92 et seq.):

> 'I remove this tube from the matrix cylinder by first heating it externally to expand it sufficiently to enable it to be unscrewed from the said cylinder, the impression being so slight that very little expansion is necessary.'

In my opinion, this could not be done. I doubt, in the first place, if an electrically plated coating could be separated from a mold even if the expansion were sufficient owing to the adhesion between the coating and mold. In the second place, I do not consider it possible to separate two molds thus united together by applying heat to them, owing to the practically constant co-efficient of exapnsion of all metals. Considering the original record to have a diameter of approximately two inches, then by subjecting the metal to as great a variation as 180°, the diametric expansion of the mold relatively to the record would not be greater than .00
of an inch, considering the record to be a steel cylinder an
the plating to be of copper. A difference in the diametri
expansion. 001 or even .003 of an inch would not be sufficie
since I have found that with ordinary records there should b
an expansion of at least .005 inch in order that in separati
a duplicate from the mold the record in relief may not be i
jured. At the outset, therefore, I believe Lioret would fin
it difficult, if not impossible, to separate the original re
ord from the mold plated thereon."

"Obviously the objection thus stated is purely academic a
"analogous to the equally unfounded statement that celluloid, if
" heated until softened, would stick to the surface of the matri
"Wurth states that it is possible to make steel record cylinders
"as Lioret describes "as I have made such records myself". Also
"it is possible to form a galvano-plastic mold upon the steel re
"cylinder thus made. The only point to which he takes excepti
"is, that the mold can be separated from the cylinder without da
"aging the record, and as to this he is merely in doubt, leaving
"to be 'difficult, if not impossible', because if subjected to a
"temperature difference of 180° the difference in expansion in a
"2 inch cylinder would be less, in his judgment, than that requir
"to prevent injury to the record. But there is no reason why th
"temperature difference should be limited to 180°, or even to tw
"that amount, for the melting point of both steel and copper is

"measured by thousands of degrees, and by judiciously applying
"a flame to the exterior of the mold while running cold water
"through the interior of the record cylinder, if necessary, a
"temperature difference could be made almost anything desired.
"Moreover, phonographic record cylinders are commonly made which
"are nearly five inches in dimaeter, in which case the difference
"in expansion, due to any given difference in temperature would
"be nearly two and a half times the amount which would occur in
"a two-inch cylinder. So that by Mr. Wurth's own showing the
"necessary difference in expansion could be obtained, with the
"larger sized commercial records, at last, by subjecting the reco
"cylinder and the mold to different temperatures well within the
"limits of feasible practice. And in my own judgment it would be
"perfectly practicable to separate the mold from a two-inch cylin-
"der as well. Any tendency for the metals to adhere to each other
"could be readily overcome by applying a suitable coating to the
"cylinder before electro-plating it, in accordance with the famil-
"iar practice of the electro-plating art. Moreover, it would ob-
"viously be possible to dissolve out the original steel record
"from the galvano-plastic mold by the use of appropriate acids,
"which would attack the steel alone, leaving the copper unharmed,
"in exactly the same manner as the original wax record is dissolved
"out of the mold of the Young patent, or of the Edison patent of
"October 18, 1892. So that from any point of view the objection
"to the Lioret process, on account of any difficulty of obtaining
"the desired mold, cannot be sustained.

"To the objection that the dipping of Lioret's mold ~~and~~
"and celluloid blank into hot water would render the process in-
"operative, by permitting water to penetrate between the mold and
"the blank, where it might fail to be expelled by the subsequent-
"ly applied pressure, and where it might interfere with the forma-
"tion of a perfect imprint on the blank, I have only to reply
"that it would be a simple minded mechanic indeed, to whom, if

"he found any difficulty of this kind, it would not instantly oc-
"cur to temporarily seal the joint between the ends of the mold
"and the matrix, as by a suitable insoluble wax, so as to prevent
"the water from entering the crevice. A more obvious expedient,
"in fact, can hardly be conceived of, or one more certain to over-
"come a suggested difficulty.

"The objection to the Young patent, that it contemplates
"and requires such a collapsing of the record as would destroy its
"shape and render the impression liable to be damaged, is founded,
"as I believe, upon a misinterpretation of the term 'collapsing'
"used in the Young patent, and is contradicted by the natural law
"governing the action of the material composing the record cylin-
"der when subjected to the cooling which the patent describes. The
"patentee's interpretation of the term 'collapsing", as evidenced
"by the amendments and arguments referred to, and the complainant's
"similar interpretation of the term, as indicated by the deposition
"of its expert, Mr. Frank Dyer, appears to be synonomous with "buck-
"ling,' and seems to contemplate the folding in of one side of the
"cylinder for the purpose of enabling it to be stripped from the
"surface of the bore of the matrix. In his deposition, Mr. Frank
"Dyer describes the Young patent as one -

> 'wherein duplicates were formed on very *thin walled cylinders which could not be contracted*, as with the invention of the patent in suit, but which required to be removed by collapsing them so as to change their shape and effect a separation of the engaged surfaces.' (The italics are my own).

"Now, considering the nature of the material of which these
"thin-walled cylinders were composed in the Young patent, to-wit., cel-
"luloid, this statement that they could not be contracted is not only
"a perfect absurdity, but it is the exact contrary of what must in-
"evitably occur when such cylinders are cooled as the patent describes
"For, as I have already pointed out, the fact is that no power on
"earth could prevent these celluloid cylinders from contracting
"away from the surface of the mold when subjected to cooling and

"when the expanding pressure upon them is released. This action necessarily results from the greater co-efficient of expansion and contraction of celluloid, as compared with the metal of which the matrix is composed, and will result in the same way whether the celluloid cylinder be thick or thin. In fact, the action with a thin walled cylinder is even more noticeable than with a thick cylinder, because it occurs much more rapidly by reason of the greater rapidity with which the thin walled cylinder gives up its heat when subjected to a cooling influence. The theory, suggested in the patentee's arguments before the Patent Office, that there is an adhesive attraction between the surface of the metal mold and the surface of the celluloid record, is a myth which has not the slightest foundation in fact, as I have heretofore pointed out. This is conclusively demonstrated in the very process carried out by defendant in making its celluloid records, and of which this complainant complains. And I have demonstrated it myself beyond a peradventure by experiments carried on for that purpose.

"As showing this, I here produce four exceedingly thin walled celluloid cylinders made in my presence and under my direction by the same process employed by defendant in making its regular commercial records. These cylinders are made of celluloid not thicker than a great deal of ordinary correspondence paper, such as business letter heads are frequently printed on, so thin, in fact, that it could not be obtained in tubular form, the cylinders having been made of sheet celluloid folded into cylindric shape and with the edges overlapped and cemented to complete the cylindric form. These cylinders, which I shall hereafter refer to as Young Patent Records Nos. 1, 2, 3 and 4, have all been expanded by internal pressure into intimate contact with the bore of a phonographic matrix made in substantially the identical manner described by Young, after being firs heated so as to soften the celluloid and render it sufficiently plast to take the impression of the matrix. And in every case, upon then "being allowed to cool, the cylinder contracted, collapsed, shrunk, "or whatever it may be called, so as to free itself from engagement "with the bore of the matrix. This collapsing or ~~shrinking or~~ "shrinkage occurred solely as a result of the cooling of the blank "and without any action or volition on my part, or on the part of "any other person present at the time. And it occurred without in "any way changing the essential cylindric shape of the blank. There "was no buckling or bending of the blank whatever. It simply freed "itself from the matrix by its own shrinkage, due to its cooling off, "and the separation was so complete within a very short period - in "some cases but a few seconds - that the cylinder, light as it is, "dropped from the matrix by its own weight when I tapped it lightly "on the end with a lead pencil. I repeat that there was no collapsing or buckling whatever of the blank, except its natural contraction or shrinkage, due to cooling. The perfect cylindric shape "of the blank, marred only by the joint at the meeting edges of the "celluloid, was maintained throughout the operation. It was not prie "out or its removal assisted in any way beyond the slightest tapping "on the end of the cylinder with a lead pencil, which was the only instrument used in this connection, and it is unquestionable but that "if given further time to cool the blank or celluloid cylinder thus "treated would have further contracted so as to have dropped out of "the matrix by its own weight without being even tapped with the pencil. These experiments were carried on in the presence of Mr. P. C. "Dyrenforth, of counsel for complainant, and the process employed was "substantially that regularly employed by defendant in the making of "its commercial records. The heating medium employed for softening the celluloid was steam at a pressure of thirty or forty pounds "to the square inch, and the ultimate expanding pressure was given the "blank by introducing compressed air under pressure of about eighty "pounds per square inch. There was no visible or detectable tendency "for the surface of the thin celluloid cylinder to adhere to the surface of the matrix, and the action of the cylinder in every respect "was substantially the same as the action of the thicker, though "still comparatively thin cylinders, of celluloid used by defend- "ant for its commercial records.

"In my judgment, therefore, there is no other reasonable conclusion "to be drawn than that the collapsing referred to in the Young pat- "ent means this inevitable shrinkage which necessarily results from "the cooling of a celluloid cylinder, whether thick or thin, and which "inevitably acts to draw it inwardly away from the bore of a surround- "ing metallic matrix and to free it therefrom, by reason of the fact "that the celluloid contracts more rapidly than the metal does. Mr. "Frank Dyer's (complainant's expert) statement that very thin walled "cylinders, such as the Young patent mentions 'could not be contract- "ed' is not true, either in theory or fact, and no distinction between "the process of the Young patent and that of the patent in suit, based "upon any such statement or allegation can be given any weight what- "ever.

"Q. 14. Do these thin walled exhibit cylinders constitute "commercially practicable records?

"A. They do not. They are made too crudely, and the sheet "celluloid of which they are formed is so thin that they will not "hold their shape. Moreover, it is too thin to enable a sufficient "flange to be turned in at each end of the cylinder to properly en- "gage the mandrel of the phonogram. Moreover, the joint at the "meeting edges of the celluloid sheet is imperfect and is so rough "that it prevented a perfect reproduction of the record line of the "matrix along the joint, except possibly in the case of 'Young Patent "Record No. 2', which is fairly well printed throughout and which I "have found to give very fair results when subjected to the reproduc- "ing style of a phonograph.

"Q. 15. I note that the thin cylinder, 'Defendant's Exhibit "Young Patent Record No. 4' is not provided with end flanges. Was "this exhibit printed in the same manner as Nos. 1, 2 and 3?

"A. Not quite, although the process employed was essential-"ly the same. In order to better show how very thin these cylinders "really are I wished to print one of them without first turning in "its ends to form flanges, as was done with Nos. 1, 2 and 3. The "object of these flanges was to engage the top and bottom plates so "as to form a seal sufficient to prevent the escape of the steam and "air when admitted to the interior of the cylinder. And in the ab-"sence of any such flange on "Exhibit No. 4", I simply took an ordin-"ary blank, such as is used for defendant's commercial records, slip-"ped the plain cylinder of Exhibit No. 4 over it, and inserted both "in the matrix, using the inner cylinder as an expansible bag, as it "were, to confine the pressure which was being applied to the thin "cylinder to force it against the matrix. This was the best "means I had on hand at the time of printing such a thin cylinder "without first turning in its ends to form flanges, and the inter-"ior flanged cylinder served, in effect, as the rubber-covered fluid "pressure expander shown in Fig. 8^{a} of the British patent to Lioret. "The only difference was that in the case in hand the inner celluloid "cylinder could not subsequently be sufficiently contracted to enable "the thin cylinder 'Young Patent Record No. 4' to be easily removed "thereform. Both being of celluloid, they both contracted together "away from the matrix, and readily dropped out of the latter, as did "Nos. 1, 2 and 3, but their contraction being equal, had no tendency "to separate them from each other , and I was obliged to cut off the "ends of the inner cylinder and run a knife blade between them in "order to remove the exhibit.

"Q. 16. What force do you find in the attempt to distin-"guish the Edison process of the patent in suit from that of the "Lioret patent, by reason of the alleged fact that the printed blank "cannot be removed from the Lioret matrix 'by direct longitudinal "movement'?

"A. None whatever. This fact, if true, is only an incidental "result of the using the particular kind of matrix described by "Lioret, to-wit, one formed about a threaded original record cylin-"der, as distinguished from one formed about the ordinary form of "original wax record, which is smooth and cylindric, except for its "record line. And this matter of the exact character of the matrix "used is obviously quite apart from the essential steps of the pro-"cess of subsequently forming a duplicate record within the matrix. "In both cases the matrix has a substantially cylindric bore provid-"ed on its inner surface with a reverse duplicate of the record line "or indentations constituting the original record. In both, a sub-"stantially cylindric blank of impressionable material is fitted with-"in the bore of the matrix. In both, this cylindric blank is soft-"ened by heating, unless we accept the patentee's - Edison's - early "contention, to the effect that his blank is heated only to expand it "and is not heated sufficiently to affect its hardness. In both, "the blank is subsequently expanded to force it into intimate contac "with the bore of the record cylinder and cause it to take an exact "imprint of the record line thereon; and in both the printed blank "is subsequently contracted by cooling 'sufficiently to enable the "sleeve c (blank) to be easily withdrawn from the tube a (matrix).' "Obviously, therefore, the actual process of making the duplicate "record is substantially the same in both cases, notwithstanding the "specific differences in the interior surfaces of the matrices and "the fact that the particular matrix employed by Lioret has a defin-"ite screw thread on its interior of such depth that the correspond-"ing thread printed on the blank may not entirely be disengaged fro "it by the contraction due to the cooling of the blank. The object "of the contraction in both cases is the same, i. e., to completely "disengage the record indentations printed in the duplicate record "from the relief record on the interior of the bore of the matrix. "And in both cases it has exactly this result, notwithstanding that "the screw-thread feature of the matrix in the one case may possibl "require the withdrawal of the printed blank by unscrewing it,

"whereas in the other case it can be withdrawn by direct longitudin-
"al movement.

"But it does not by any means follow that the duplicate
"record may not be withdrawn from the Lioret matrix, in many cases
"at least, 'by direct longitudinal movement' notwithstanding the
"presence of the screw-threads . It is entirely a matter of the
"diameter of the record and the depth of the screw-threads. Lioret's
"British patent, it will be noted, says nothing about any necessity
"of unscrewing the record. It simply says that the matrix containing
"the expanded blank

> 'is then plunged into cold water, and the celluloid again hardened, at the same time contracting sufficiently to enable the sleeve c [the celluloid record] to be easily withdrawn from the tube a'.

"The assumption that an unscrewing of the celluloid record is
"a necessity, appears to be predicated upon certain statements in
"the U. S. Patent to Lioret, No. 528,273 of October 30, 1894. But
"this same U. S. patent points out that '

> 'the threads of the matrix are very fine in practice and are very much exaggerated in the drawing to facilitate the illustration.' (lines 124-127, p. 2)

"And it will be evident that with a fine thread and a record
"cylinder of considerable diameter the contraction of the celluloid
"record might easily be enough to not only release the record inden-
"tations from the matrix, but the screw-thread as well. For ex-
"ample, I here produce a commercial celluloid record, manufactured by
"the defendant company and entitled 'Lost Chord Song'. And I also
"produce the matrix in which this identical record was formed under
"the process practised by defendant. And it will be noted that the
"diameter of the celluloid record is considerably less than the di-
"ameter of the bore of the matrix. It is something more than a
"sixteenth of an inch less, as near as I have been able to measure
"it, so that, had this matrix been made after the fashion of the
"Lioret matrix upon an original record having a thread cut in it,
"the contraction of the celluloid blank would nevertheless have

"been sufficient to entirely clear not only the record indentations, "but the spiral threads as well, providing these threads were 'very "fine', as the Lioret patent states they are in practice, as above quot "True, the depth of the thread in this case could not have been "greater than a sixty-fourth of an inch, but threads of no greater "depth than this are perfectly practicable and are frequently em-"ployed in mechanics, and it will be remembered that a sixty-fourth "of an inch is an enormous depth, as compared with the depth of the "indentations of an ordinary phonographic record, which can only be "measured in ten-thousandths of an inch.

"I wish further to state in this connection that in my "judgment it is quite immaterial how or in what manner Lioret pro-"posed to obtain his matrix or mold, whether from a screw-threaded "original cylinder or not. For the common wax or soap records were "well known at this time, being an ordinary article of commerce, and "the method of making matrices or molds from these records had al-"ready been disclosed in the Edison 1892 patent, if, indeed, it could "not be said to have been known as a matter of common knowledge with "mechanics familiar with the electrotyping process. It was, con-"sequently, open to Lioret, or to anyone reading the Lioret patent, "to employ wax originals, and matrices used from these wax originals, "if so desired, instead of employing threaded steel originals and "matrices made therefrom. And there is nothing, in my judgment, "about the Lioret process of subsequently forming celluloid duplicates "within a substantially cylindric matrix, which necessarily limits "the process to the use of a matrix made from screw-threaded steel "records, or to any other particular matrices. With any matrix, "and especially with a matrix formed under and in accordance with "the Edison 1892 patent, the Lioret process would obviously produce "a duplicate of the original record in exactly the same manner and "with equally as perfect results, as though a matrix made from "Lioret's threaded steel cylinder had been employed.

"Q. 17. In your judgment, of what force is the contention "that the Edison process of the patent sued upon is distinguished "from the prior art processes of making celluloid phonographic "records, in that Edison uses a blank 'sufficiently thick to main- "tain its shape during and after the act of disengagement from the "matrix'?

"A. This distinction obviously obtains, if at all, on- "ly as to the Young patent. The blank employed by Lioret is evi- "dently just as thick as the blank employed by Edison. Lioret does "not mention this matter of the thickness of the blank, but neither "did Edison in his original specification. In both cases the fact "of the blank's being thick enough 'to maintain its shape during an "after the act of disengagement from the matrix' must be predicated "on the drawings alone. The first mention of it in the Edison "specification was in an amendment dated March 20, 1900, more than "two years after Edison's application was filed. This amendment is "stated to have been made because and in view of the grant of the "Lambert patent No. 645,920, of March 20, 1900, in which patent the "same phraseology is employed. Evidently, however, the record which the patentee Edison had in mind and particularly contemplated making "by the process of his application was the ordinary taper bored wax "or silk record, which is the standard Edison product even to this "day, and which is necessarily thick, brittle and unyielding, as "distinguished from the thin, tough, and elastic celluloid records "produced by complainant, for example.

"Aside from this and omitting the Lioret patent from considera- "tion, there is only one view, in my judgment, in which the matter "of the thickness of the blank can be regarded as in any way dis- "tinguishing Edison's process from that of the Young patent, from "which the reference to the thickness of the blank cylinder employed "was admittedly intended to distinguish; and that is that the Edison "process contemplates and is strictly limited to the printing of the "record lines upon the surface of the blank by the pressure of its "own expansive power, due to heating. It is undoubtedly a fact "that the expansive force of the material itself can only be prac- "tically utilized to obtain the desired impression on the exterior "of the blank when the latter is of relatively great thickness and "capable of affording its own backing, as it were, to force itself "against the interior surface of the matrix. And it is evident "that no such action as this is contemplated or occurs in the "Young process , in which the expanding pressure on the blank "is evidently applied or derived from some source entirely aside "from any expansive action of the material itself, this being "also true of defendant's process, as will presently appear. So "that, if regarded as thus limited, the Edison process may perhaps "be distinguished from that of the prior patent to Young along "these lines.

"But if it be not regarded as thus limited to the printing "of the blank by its own expansive force when heated, the attempt "to distinguish by the thickness of the blank operated upon is, in "my judgment, nothing more nor less than absurd. Obviously the "process is unchanged , whether the material employed is supplied "in thin cylinders or thick ones. A thin cylinder will be soft- "ened by heat in the same manner as a thick one. It will be ex- "panded by pressure in the same manner as a thick cylinder, and "even more readily. And it will contract when cooled, and will "free itself from the surface of the matrix so that it may be moved "'by direct longitudinal movement' in the same manner as a thick "cylinder, and even more rapidly. Every step in the process will "be exactly the same and will produce exactly the same result, and "exactly the same summation of results, no matter where the thick- "ness of the cylinder employed, or whether it may or may not be "capable of maintaining its shape after disengagement from the "matrix. During the act of disengagement from the matrix the very "presence of the matrix itself serves to maintain the cylindric "shape of the blank, regardless of the thickness of the material "employed, there being not the slightest tendency or necessity of "the blank's losing this cylindric shape until actually withdrawn "from the matrix, even with blanks of the thickness of paper, such "as shown in 'Defendant's Exhibit Young Patent Records Nos. 1, 2, 3 "and 4.'

"In considering Edison's process as of any broad scope, there- "fore, its limitation as to the thickness of the blank operated up- "on is at best mere surplusage, if, indeed, it be not regarded as "a bald aggregation of the article itself with the steps of the opera- "tion constituting the process. And in no case, in such a broad view, "can this thickness of the blank operated upon be considered as dis- "tinguishing Edison's process in the least from the prior process "of the Young patent, even assuming that exactly similar thick "blanks were not shown to have been employed in the exactly sim- "ilar process of the Lioret patent. Moreover, any distinction thus " drawn between the Young process and the process of the Edison patent "sued upon must equally obtain as between the Edison process and that "employed by defendant, since defendant's process involves the use "of essentially thin as compared with thick record cylinders, and "is in every way like the Young process, except as it has been de- "veloped and perfected in ways as to which neither the Edison pat- "ent nor any of the patents of the prior art give the slightest hint."

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, considering these questions to be repeated, except that I am unable to produce at this time the exhibit records and blanks which I produced in connection with my former answers, as therein appears. These exhibits were introduced and used in evidence in said former case of National Phonograph Company vs. Lambert Company, No. 1154 in the Circuit Court of Appeals for the Seventh Circuit, but have since disappeared, so that I am unable to locate them.

I have particular reference to the following exhibits of that case, to-wit: "Defendant's Exhibit Young Patent Record No. 1"; "Defendant's Exhibit Young Patent Record No. 2"; "Defendant's Exhibit Young Patent Record No. 3"; "Defendant's Exhibit Young Patent Record No. 4; and "Defendant's Exhibit Lost Chord Record and Matrix".

Q. 12. Please answer the same question with regard to Q. 18, and your answer thereto, of your deposition in said former case of National Phonograph Co. vs. Lambert, such question and answer occurring in the record of that case as follows:

"Q. 18. Please state whether or not you have seen defend-
"ants' process as it is carried on in the regular course of de-
"fendant's business, and if you have, please briefly describe the
"process as thus carried on?

"A. I have observed defendant's process by the hour, as
"that process is carried on in the regular course of defendant's
"business of manufacturing celluloid phonograms or phonographic
"records, and I am pretty thoroughly familiar with it. The pro-
"cess in brief is as follows:

"The celluloid used for forming the blanks comes to the
"factory in the shape of thin-walled tubes about six feet in
"length. The thickness of the material of which the tubes are
"formed is between forty and fifty one-thousandths of an inch
"(less than a twentieth) and I understand that it is the thinnest
"celluloid which can be obtained in tubular form. These tubes
"are not straight or of uniform diameter. On the contrary, they
"come to the factory in very irregular shape, being buckled,
"flattened and indented in almost every conceivable way. This
"is due to the fact that they are formed by forcing the cellu-
"loid, when soft, through a thin annular opening over a mandrel,
"from which they are removed while still wet, and then hung up
"to cure or dry out, during which operation they shrink and bend
"into all sorts of irregular shapes, though still preserving a
"generally tubular form.

"The first operation in defendant's factory is to pass these
"rough tubes over a steam-heated mandrel, by which they are brought
"back to an approximately exact cylindric shape and uniform diame-
"ter. Each tube is then cut into lengths of about four and a half
"inches, or just sufficiently longer than the length of the finish-
"ed blank to enable the ends of the piece of tubing to be turned
"in to form the flanges, which are so noticeable a feature of de-
"fendant's record.

"These flanges are turned in by forcing the piece of tubing
"down upon a heated plate having a rounded annular groove cut in
"it, into which the end of the tube is pressed. Two such plates
"are ~~pressed~~ used, having grooves of slightly different shape,
"to form the flanges at the opposite end of the tube, as these
"flanges are not exactly alike, as will be noted. A rough blank,
"having its ends thus flanged in, I here produce, by way of ex-
"ample, and have designated 'Defendant's Exhibit Defendant's Rough
"Blank.' Such rough blank is then dyed in an acetone composition
"containing a black coloring matter, which gives it a smooth glossy
"surface. The blank, when dried, is then ready for printing, and
"appears like the sample which I here produce and shall refer to
"as 'Defendant's Exhibit Defendant's Finished Blank.'

"The process of printing the blank of course involves the
"production of a matrix, having upon its interior a relief of
"the record to be duplicated. These matrices are made by the de-
"fendant almost exactly as described in the English patent to
"Young. That is to say, a wax master record cylinder, of the
"well-known form, is placed in a phonograph and indented or cut
"with a spiral line by a style attached to a diaphragm, which is
"caused to vibrate by the speaking voice or by the sounds from a
"musical instrument, band, or orchestra. The master record is
"then coated with a compound containing plumbago and of an elec-
"trically conductive nature, after which it is placed in an elec-

"troplating bath and plated with copper to a sufficient thickness "to form a matrix cylinder, from which the wax master record is "then removed. This copper matrix cylinder is then placed within "a much larger iron ring, between which and the copper cylinder "plaster of Paris is poured and allowed to harden, thus forming "a matrix capable of sustaining great internal pressure.

"The printing of the blank with the duplicate record is "then accomplished as follows: The finished blank like 'Defendant's "Exhibit Defendant's Finished Blank' is placed within the matrix, "the outside diameter of the blank being slightly less than the bore of the "matrix, so that it fits easily within the latter. No exactness "of fit is necessary, and as both the matrices and the blanks "vary more or less in diameter, it frequently happens in practice "that there is a considerable amount of play - the sixteenth of an "inch or so - between the matrix and the blank when inserted, al"though the fit is usually to within a thirty-second of an inch "or so in the ordinary small or two-inch record.

"Both the matrix and the blank are now placed upon a bottom "plate, which is grooved somewhat like the hot plate used for turn"ing the end flanges, and the lower end of the blank drops down in"to this groove and is thereby centered over a hole in the plate, "to which air and steam pipes are connected. The top plate is then "lowered into the upper end of the bore of the matrix until it rests "firmly upon the upper end of the blank, this top plate being car"ried at the lower end of a plunger rod, which is locked in place "as soon as the top plate firmly engages the record.

"Steam is now admitted to the interior of the blank through "the hole in the bottom plate, under a pressure which ordinarily "runs about forty pounds to the square inch, according to my obser"vations of the steam-gauge. And under the heat and pressure of "this steam the celluloid softens so that it readily conforms to "the exact surface of the surrounding bore of the matrix. The "steam pressure is ordinarily applied for about a minute, after "which it is turned off and cold air immediately admitted in its "place through the same opening in the bottom plate and at a press- "ure twice as great, or of upwards of eighty pounds to the square "inch, according to the gauge. Under this air pressure the blank "quickly hardens while still ~~bein~~ held in intimate contact with "the interior surface of the matrix, and the record indentations "received from the matrix are thereby permanently set in the sur- "face of the celluloid.

"The air pressure is now turned off and the printing operation "is complete, subject only to the removal of the record from the "matrix. This removal is accomplished by lifting the matrix out "of the machine and placing it upon a bench, where it is allowed "to remain until the celluloid blank, or rather record, has cooled and shrunken sufficiently to allow it to be drawn out endwise,this "operation being facilitated by the fact that the bore of the matrix "is made on a slight taper, so that it more readily releases the "phonogram. The length of time which the record is allowed to cool "before being removed from the matrix is governed in practice by "the other duties of the operator. Defendant's printing machines "(by these I mean the pairs of top and bottom plates with their res- "pective supports and steam and air connections) are arranged in du- "plicate sets of about ten or a dozen machines to each set. And the "same operator handles both sets of machines - with the aid of an "attendant - the printing operation being carried on in one set of "machines while the matrices and inserted blanks are being removed "from and again replaced in the machines of the other set. Sever- "al sets of matrices are also employed, so that part of them may be "loaded with new blanks while others are standing with the printed "records in them to cool and shrink until finally capable of being "removed and replaced with new blanks to be printed. Ordinarily "the cooling is carried to such a point as will enable the newly "printed record to drop out when a slight pressure is applied to "the end of the record at the smaller diameter of the slightly "tapered bore of the matrix.

"The duplicate record is now complete, except that its "flanges must be reamed out to fit the mandrel of the phonograph "machine in which they are to be used, and the completed article "is of the appearance of the sample which I here produce, and "which bears on its end the legend '878 - Uncle Josh in New York.'"

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, considering the question to be repeated, except that I am unable to produce at this time the three samples referred to, "Defendant's Exhibit Defendant's Rough Blank", "Defendant's Exhibit Defendant's Finished Blank", and "Defendant's Exhibit Defendant's Finished Record Uncle Josh in New York". These exhibits were introduced and used in evidence in said former case of National Phonograph Company vs. Lambert Company, but have since disappeared, so that I am unable to locate them.

Q. 13. You have already stated, in answer to Q. 5 of the record in this case, that you are familiar with the process of manufacturing celluloid phonograms or phonographic records carried on by the defendant Indestructible Phonographic Record Company, except as to the exact manner of making the molds or matrices.

Omitting this matter of the making of the matrices, please state in what respects, if at all, the process of manufacturing celluloid phonogram blanks carried on by the defendant Indestructible Phonographic Record Company, is like the process of manufacturing the celluloid phonograms which was carried on by the defendant Lambert Company in the former case of National Phonograph Co. vs. Lambert Co., as seen by you, and as described in your answer to Q. 18 of the Lambert Record, just above quoted?

A. The process of making celluloid phonograms carried on by the defendant Indestructible Record Company is substantially the same process that was carried on by the Lambert Company, and which I described in my answer referred to. The only differences involved ar matters of detail having no bearing on the essential manner of printing the record. And even as to detail, I noted only two or three points, first, the Indestructible Phonographic Record Company dyes its records black by applying the acetone composition to the exterior of the celluloid tube before it is cut into record lengths instead of by applying the composition to each length or blank individually. Second, the Indestructible Phonographic Record Compan inserts in each record, after printing it, a substantial backing formed by a cylinder of paper or straw board having iron rings at its ends. Third, in order to permit of the insertion of this backing, one of the flanges previously turned in at the ends of the blank, is cut off immediately after the printing operation takes place. The backing is then forced in with a press, and the end of the blank through which the backing enters again flanged inwardly slightly by applying it to a heated plate.

Aside from these differences in the immaterial details of the process, the description of the px commercial practice of the Lambert Company in manufacturing its celluloid phonograms, given by me in my answer to Q. 18 of my deposition in the Lambert case , and just above quoted, may be taken as a description of the commercial practice of the defendant Indestructible Phonograph Record Company in the manufacture of its celluloid phonograms, and I here produce two samples showing different stages of the operation as carried on by the Indestructible Phonographic Record Company. One of these samples is marked "Defendants' Exhibit Defendants' Finishe Balnk Blank", and shows a celluloid blank as it appears when ready to be placed in the matrix and printed. The other sample is marked "Defendants' Exhibit Defendants' Finished Record No. 3094. Band. Isabella Overture." This sample represents the finished product of the defendant company, and except for its interior backing is substantially identical with the old celluloid records made by the Lambert Company, one of which I here produce. This old Lambert record bears the No. 971 and the name "Carnival of Venice-Clar."

By Mr. Scott: Counsel for Defendants offers in evidence the two samples referred to by the witness as marked, respectively "Defendants' Exhibit Defendants' Finished Blank" and "Defendants' Exhibit Defendants' Finished Record No. 3094. Band. Isabella Overture", and requests the Examiner to so mark them: also the old Lambert record referred to by the witness, and which the Examiner is requested to mark "Defendants' Exhibit Old Lambert Record, No. 971. Carnival of Venice".

The last exhibit offered is objected to as incompetent, irrelevant and immaterial, and as not properly proven.

Adjourned until June 4, at 10 o'clock A.M.

Chicago, June 4, 1910. Parties met pursuant to adjournment. Present as before.

Q. 14. In answer to Q. 19 of the Lambert record, you testified as to the objects of the end flanges of the Lambert celluloid record. This question and your answer thereto read as follows:

"Q. 19. What is the object of the end flanges of defendants' celluloid record.

"A. They are three-fold: (1) To give the necessary "rigidity and strength to the record, the cylindric wall of which "is too thin to properly support itself, except as thus strengthen"ed. (2) To afford a means of engaging the thin cylindric record "with the smaller and tapered mandrel of a phonograph. (3) To af"ford a means of sealing the record tightly against the top and "bottom plates of the printing machine when subjected to the "pressure of the steam and air admitted to the interior of the "record."

You may state whether or not you so testified and whether your testimony in this respect as to the Lambert record applies to the celluloid record of the Indestructible Phonographic Record Company?

A. I did so testify and wish to be understood as so testifying now, considering the question as repeated.

The statement of my former answer with regard to the Lambert record must, however, be modified as to the celluloid record now made by the Indestructible Phonographic Record Company, because of the introduction of the backing in the latter. This backing greatly adds to the rigidity and strength of the record and serves directly to engage the tapered mandrel of the phonograph, the flanges being no longer utilized for this purpose.

Q. 15. I call your attention to Q. 20 of your deposition in the Lambert record and your answer thereto, which read as follows:

"Q. 20. Is the contraction or shrinking which occurs when "the record is cooled, and by reason of which the record frees "itself from the surface of the matrix after being printed, in "any way due to the presence of these flanges?

"A. Not in the least. The record would shrink and free "itself from the mold, or interior surface of the matrix, in "exactly the same way, and even more quickly, if these flanges "were omitted, the only effect of the flanges being to delay "the cooling operation somewhat by affording a greater mass of "material for the heat to linger in. And this is equally "true regardless of the thickness of the celluloid employed. "For example, and as proving this, I have had made some ex-"ceedingly thin records from which the flange has been omitted "at one end. These are exactly like 'Defendant's Exhibit "Young Patent Records Nos. 1, 2 and 3', except in the omission "of the flange at one end, and they were made and printed in "exactly the same way, and all of them in exactly the same way as defendant's regular commercial "records are made. These additional thin records thus pro-"duced I shall refer to as 'Defendant's Exhibit Young Records

"Nos 5, 6 and 7.' The object of making them as above stated
"was to see whether or not they would shrink, so as to free them-
"selves from the matrix when cooled, without any buckling or col-
"lapsing other than the natural contraction due to the cooling of
"the material, notwithstanding the absence of the flange. They
"did so contract and loosen themselves from the surface of the
"matrix entirely by their own action, just as in the case of 'De-
"fendant's Exhibits Young Patent Records Nos. 1, 2 and 3'; and th
"contraction took place so immediately after the shutting off of
"the air pressure that in the case of No. 5, which was first prin
"ed, the record fell from the matrix without being touched, and
"while the matrix was being lifted from the machine to the bench.
"In the case of Nos. 6 and 7 the matrix was hotter, and it conse-
"quently took longer for the blank to cool, but in both these cas
"the contraction was sufficiently complete within a couple of min
"utes or so to cause the blank to drop from the matrix at the
"slightest touch.

"I would also point out in this connection that the end of
the record from which the flange was omitted was the uppermost en
"as the blank stood in the printing machine, and was the end whic
"is wholly contained within the bore of the matrix during the pri
"ing operation. The lower end of the blank always projects down
"below the end of the matrix into the groove of the bottom plate,
"and I employed the flange at this lower end for the reason that i
"is almost impossible to make a proper seal against the escape of
"steam and air at this point unless a flange on the record itself
"is present. At the upper end of the record, which is wholly wi
"in the matrix, it is more easy to attain a sufficient seal by a
"top plate which fits closely into the matrix, even if the flange
"is omitted. And the presence of the flange at the lower end of
"the record would obviously have no effect upon the shrinkage at
"its upper end. I would also state that of these exhibits, Nos.
"6 and 7 appear exactly as they did when they dropped from the

"matrix. No. 5 had its lower end flange trimmed out some-
"what with a knife, but is otherwise exactly as it was when
"it dropped from the matrix, and its upper or unflanged end
"in particular has not been touched."

Please state whether you did so testify, and whether it is equall true of the records made by the defendant Indestructible Phonograp ic Record Company that the contraction or shrinkage which occurs when the record is cooled,and by reason of which the record frees itself from the surface of the matrix after being printed,is not i any way due to the presence of the flanges of the record?
~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated, except that I am unable to again produce the thin records which I referred to in my former an swer, and which were designated "Defendant's Exhibits Young Recor Nos. 5, 6 and 7". These thin records were introduced and used in evidence in the Lambert case, but have since disappeared and I hav been unable to find them.

It is equally true of the celluloid records made by the defen ant Indestructible Phonographic Record Company that the contractio or shrinkage which occurs when the record is cooled, and by reason of which the record frees itself from the surface of the matrix a ter being printed, is not in any way due to the presence of the in turned flanged on the record. The action of the record of the present defendant in this respect is identical with the action of the records formerly made by the Lambert Company, concerning which I testified, and what I have said in my answer to Q. 20,above quoted, may be regarded as applying equally to the records of the present defendant company.

Q. 16. I call your attention to Q. 22 of your deposition in the Lamber case, and to your answer thereto, which read as follows:

"Q. 22. Please examine the copy of the patent to Messer
"No. 705,772, of July 29, 1892, which I now hand you, and

"state how the apparatus described therein compares with the "machines actually employed by defendant in printing its records, "as described in your answer to Q. 18?

A. The machines so employed by defendant are substan-"tially exact copies of the apparatus shown in this Messer pat-"ent, and these machines are used in substantially the same way "which the Messer patent describes."

Please state whether you so testified, and whether or not the same answer applies to the machines used by the present defendant company?

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated.

Substantially the same answer applies equally as between the Messer patent No. 705,772, referred to, and the machines now employed by the present defendant. That is to say, the machines employed by the present defendant involve substantially the same features of construction and operate in substantially the same manner as the apparatus which the Messer patent sets forth . Barring a few differences in detail, the machines used by the present defendant are like those used by the Lambert Company, and they operate in substantially the same way.

Q. 17. I call your attention to Q. 24 of your deposition in the Lambert case, and your answer thereto, which read as follows:

"Q. 24. Is it practicable to make a duplicate phonographic "record of wax or waxlike soap, such as complainant's Edison "records are made of, using the machines and following the "process employed by defendant in the manufacture of its cellu-"loid records?

"A. It is not. I have made several attempts to do so, "using a regular Edison record cylinder of complainant's manu-"facture, and have been utterly unable to obtain any results "whatever. The steam simply disintegrates the waxlike mater-"ial - blows it into soap-suds, as it were - long before it is "softened sufficiently to expand or be expanded against the "matrix. The remains of an Edison soap record, which I here "produce and have marked 'Defendant's Exhibit Edison Soap Cylinder Destroyed by Lambert Process', show the result one of these "attempts. And the remains of a similar Edison record, which I "here produce and have marked 'Defendant's Exhibit Edison Soap "Cylinder Injured by Lambert Process,' show the result of another such attempt. This latter attempt was made in the presence of a witness, a Mr. Miller, who was present in behalf of "the complainant company by the invitation of Mr. Sheridan, defendant's solicitor, and Mr. Miller's suggestions were followed "as closely as possible in making the test. The only essential "difference between the two attempts was that in the latter, at "Mr. Miller's request, the steam was turned on for only a few "seconds, in the hopes that its destructive effect upon the wax-"like soap would not be noticeable in such a short time, and it "was not nearly so noticeable, as will appear from a comparison "of the two exhibits. But as the result of the short exposure "to the steam the blank did not become heated enough to take any "impression whatever from the matrix, notwithstanding the pressure to which it was subjected."

Please state whether you so testified and whether you are able t produce the two Edison soap records referred to in your former deposition as "Defendant's Exhibit Edison Soap Cylinder Destroye by Lambert Process", and "Defendant's Exhibit Edison Soap Cylind Injured by Lambert Process"?

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated, except that I am unable to produce at this time the two soap records referred to. They were introduced in evidence in the Lambert case, but have since disappeared and I have been unable to find them.

Q. 18. I call your attention to Q. 25 of your deposition in the Lambert case, and your answer thereto, which read as follows:

> "Q. 25. Is it possible to produce one of defendant's celluloid records by the process described in the Edison patent "in suit?
>
> "A. It is not. The thin celluloid will neither expand of "itself so as to take the imprint of the matrix, nor can it "be forced out by a tapered mandrel so as to take the impression, for the reason that its very thinness precludes the "possibility of its being provided with a tapered bore. And, "obviously, the different sized openings in its flanges, which "serve the same purpose in grasping the tapered mandrel of the "phonograph as does the tapered bore of complainant's wax or "soap records, would not aid in the least in the application "of a mandrel to the interior of the blank for the purpose of "forcing it out against the matrix. In fact, the very presence of these flanges, which are essential to a thin celluloid record such as is made by defendant, renders it impossible to insert a tapered mandrel for the purpose of expanding the record against the matrix, even assuming that the "cylindric wall of the record was thick enough to admit of its "being tapered on its interior."

Please state whether you so testified, and whether or not your answer applies as regards the possibility of producing one of the present defendant's celluloid records by the process described in the Edison patent in suit?

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated.

My statement that it was not possible to produce the Lambert celluloid records by the process described in the Edison patent equally applies with regard to the celluloid records made by the present defendant Company, and for the same reasons as expressed in my answer to Q. 25, which you have above quoted.

Q. 19. I call your attention to Q. 26 of your deposition in the Lambert case, and your answer thereto, which reads as follows:

"Q. 26. Have you made any attempts to produce or print a
"thin celluloid record, ~~xixx~~ such as is manufactured by
"defendant, by the process of the Edison patent in suit?

"A. I have, and here produce two samples showing the
"result of these attempts. The first of these, which I shall
"designate 'Defendant's Exhibit Defendant's Finished Blank Edis
"Processed No. 1', was one of defendant's ordinary blanks, ready
"for printing, and identical in all respects with 'Defendant's
"Exhibit Defendant's Finished Blank'. This blank I inserted in
"defendant's matrix (one of its ordinary stock matrices) which
"I here produce and shall refer to as 'Defendant's Exhibit Matr
"No. 879 A.' I then placed both the matrix and the inserted
"blank in an oven and subjected them to a temperature of in the
"neighborhood of 300° Fahrhenheit for fifteen or twenty minutes
"The heat was so great that it softened the celluloid until its
"previously inturned flanges straightened out, as the exhibit
"shows, and the blank was left in the oven until the celluloid
"began to show signs of disintegration, as the ends of the
"exhibit will indicate -- indeed, it was left in until I did
"not dare to leave it there any longer for fear of the complete
"disintegration of the blank, an experience which I had just pr
"viously had with an exactly similar blank placed in the oven u
"der exactly similar conditions and left there for about thirty
"minutes, at the end of which it was a mere mass of loosely ad-
"hering charred material. I then removed the matrix and blank
"from the oven and immediately plunged both into very cold wate
"for the purpose of shrinking the blank out of the matrix. Pre
"vious to entering the water the blank was tightly engaged with
"the matrix, but within a few seconds after being plunged in th
"water it had contracted to such an extent as to be readily wit

"drawn therefrom; and it was then in the exact condition in "which it appears as I now produce it.

"The second sample , which I shall refer to as 'Defend- "ant's Exhibit Defendant's Finished Blank Processed No. 2', was "heated in the same matrix and under the same conditions, but "for a somewhat less time, and as a result it shows somewhat "less the effect of the heating. In neither case, it will be "noted, is there the slightest appearance of any imprint on the "surface of the blank, although I was careful to pick out for "these tests blanks which fitted the matrix as tightly as would "any of those in defendant's stock, and much more tightly than "do the blanks ordinarily fit the matrices in defendant's regu- "lar commercial work of manufacturing records."

Please state whether you so testified, and whether you have anything to add to your former testimony in this respect?

~~Objection to Q. 8 repeated.~~

A. I did so testify, and wish to be understood as so testifying now, except that I am unable to produce the exhibit blanks and the matrix referred to in that answer. These blanks and the matrix were introduced and used in evidence in the Lambert case, but have since disappeared, and I have been unable to find them.

I would add, however, that there is no question but what the same attempts, if carried on with the celluloid blanks of the present defendant Company, would show exactly the same negative results for there is no ~~possibility of~~ practical difference between these blanks of the present defendant company and the celluloid blanks of the Lambert Company.

Q. 20. I call your attention to Q. 27 of your deposition in the Lamber case, and your answer thereto, which reads as follows:

"Q. 27. Is it practicable to make thick celluloid records "by the process of the Edison patent in suit?

"A. It may be possible as a laboratory experiment, al- "though I have not succeeded in doing so in the several attemp

"which I have made to this end. As a commercial operation it
"is not practicable, whether possible or not. The thick records
"'Defendant's Exhibit Carter Record No. 1' and 'Defendant's Ex-
"hibit Carter Record No. 2' represent the results of two of my
"attempts to make such celluloid records by the Edison process.

"These attempts were made in the presence of complainant's
"representatives, Messrs' Miller and Hecht, and Mr. Miller's sug
"gestions were followed as closely as possible in making the test
"In both cases the heating was done with a tapered metallic man-
"drel inside of the blank and the matrix, the whole being place
"in an oven heated to a temperature great enough to melt an ordi
"ary Edison soap record, probably about 280° Fahrenheit. After
"being heated a while the matrix was removed, with the blank and
"mandrel inside of it, and the mandrel was driven in by a number
"of smart blows with a heavy hammer. They were then returned to
"the oven and subjected to further heating, and then again taken
"out and the mandrel further driven in. This operation was repe
"ed several times, with a view to securing the fullest advantage
"both of the heating and of the driving in of the mandrel in ex-
"panding the blank into intimate contact with the bore of the
"matrix. The entire operation in the case of 'Carter Record
"No. ~~xk~~ 1' occupied nearly three-quarters of an hour. In the
"case of 'Carter Record No. 2' the time occupied was not quite
"so great.

"I also here produce a thick celluloid blank, which I
"shall designate as 'Defendant's Exhibit Carter Record No. 3.'
"This represents the result of a further attempt on my part to
"make a thick celluloid record by the Edison process, omitting
"the use of a mandrel and depending upon the expansion of the
"material itself for the purpose of impressing the blank cylin-
"der against the bore of the matrix. This blank 'Carter Record
"No. 3' was placed by me in 'Defendant's Exhibit Matrix No. 879
A' and subjected therein to a heated atmosphere of in the neigh-

"borhood of about 300° Fahrenheit for a period of about twenty
"minutes, as long as I dared leave it for fear of disintegra-
"tion. The matrix was then removed from the oven and plunged
"into cold water to shrink and loosen the blank, which was
"thereupon withdrawn and appeared exactly as it appears at the
"present time, without a trace of any record impressions upon
"its exterior.

"In this connection, however, it is only fair to the pro-
"cess of the patent in suit to say that the experiments with
"these exhibits, Carter Records Nos. 1, 2 and 3, were carried on under conditions which in some respects were rather
"crude. As there was no thick celluloid tubing at hand in
"the factory, or in the city, so far as I could determine, it
"was necessary to build up a thick walled blank by filling in
"a piece of the ordinary thin tubing employed by defendant
"with a piece of sheet celluloid bent into cylindric shape
"and cemented. And, as a consequence, the thickness of the
"blank produced was not quite uniform. Nor was its exterior
"diameter quite uniform, although probably as nearly so as de-
"fendant's finished blanks usually are. Neither did the blanks
"fit the matrix as closely as might have been possible, probab-
"ly not more closely than defendant's regular finished blanks
"fit the matrices on an average in defendant's ordinary commer-
"cial process. For it will be understood that it is almost im-
"possible to obtain celluloid blanks which are of exactly uni-
"form diameter or will fit a given bore very exactly. It can
"be done experimentally by turning off the blank in a lathe,
"as the Edison patent suggests, but while turning off a wax
"or soap record is a rapid and easy operation, the turning off
"of celluloid is so slow and difficult as to be commercially
"impracticable.

"While, therefore, the expansion of the blank against
"the matrix may not have been as perfect as might have been the
"case under the most favorable conditions, these experiments

"are, in my judgment, conclusive as showing at least that the "printing of a celluloid blank by the force of its own expan- "sion when heated is an idle dream, the utter impracticability "of which only goes the further to show that the patentee Edi- "son knew nothing of the action of this material under his pro- "cess at the time he disclosed it to the Patent Office. With sufficient heat and great pressure applied from some source "entirely aside from the material itself, celluloid may be made "to intimately engage the bore of the matrix, but the material "is too elastic, and not soft enough, even in its most plastic "condition (it never melts or becomes fluid), to enable it to "take the impression by the force of its own expansion. More- "over, I am also convinced that it is commercially impracticable "to obtain the necessary expansion by the use of a tapered man- "drel, although, as before stated, it may be possible to do so "as a laboratory experiment."

Please state whether or not you so testified , and whether you have anything at present to add to this answer considering the question to be repeated.

A. I did so testify, and wish to be considered as so testifying now, except that I cannot now produce the exhibit records and matrix referred to in my answer to Q. 27, above quoted, as these were used in evidence in the Lambert case, but have since disappeared and I have been unable to find them.

Q. 21. I call your attention to questions 28, 29 and 30 of your deposition in the Lambert case, and to your answers thereto, all of which read as follows:

"Q. 28. I take it, then, that you do not consider either "the Edison patent in suit, or the Lioret patent, in so far "as that relies upon a tapered mandrel to expand the blank, "as disclosing practically operative processes of making du- "plicate phonographic records of celluloid. Is this correct?

"A. It is. In my judgment neither the Edison process "nor the Lioret process, in so far as it contemplates the use of "a tapered mandrel to expand the blank, discloses a practicable pro-"cess for the commercial manufacture of celluloid records. Not only "is the employment of a tapered mandrel a doubtful expedient, so "far as the obtaining of the desired intimacy of contact between "the record and the matrix is concerned, but it necessarily involves "the employment of a blank having a bore tapered throughout its "length, and this means a blank of great thickness and necessarily "great weight and prohibitive cost. For with the weight increased "fourfold, as with the Exhibits Carter Records Nos. 1, 2 and 3 "when compared with defendant's regular records, the cost of the "celluloid alone would be more than the entire selling price which "these records can command in the market in competition with the or-"dinary wax or soap records.

"The fact is that up to the disclosure of the Messer patent "no practicable method for the commercial manufacture of celluloid "records was known. The Lioret and Edison processes, with their "tapered mandrel expansion, necessarily involved the employment of "thick,walled ~~paper~~ taper bored record , like complainant's Edison "wax or soap record, which has so long been standard on the market. "And while Young contemplated employing thin celluloid blanks he did "not disclose any practicable means of expanding such thin blanks any "more than Edison did. Nor did any of them realize that heating with "steam was the only practicable method of softening the celluloid and "expanding with air the only practicable method of setting the cellu-"loid while in intimate contact with the matrix. It remained for "Messer to develop these indispensable steps of defendant's process, "which is believed to be the only process of manufacturing celluloid "records that is commercially possible. And it remained for Messer "to devise the method of sealing the record against the top and bottpm "plates which confined the air and steam pressure within the record by "by means of flanges turned over from the body of the celluloid cyl-

"inder, a conception which is the keynote to success in this "line of manufacture - the final step crossing the line from "commercial failure to commercial practicability.

"Q.29. In this development toward the ultimately successful process of manufacturing commercial celluloid records, what "assistance do you find that the Edison patent in suit gave?

"A. Not the least in the world. I think I am perfectly safe "in saying that no unprejudiced person can examine the Young and "Lioret patents of the prior art and the Edison patent in suit, "in connection with the Messer patent, without concluding that "there is not a single idea or suggestion in the Edison patent "which was not previously disclosed in the Young and Lioret patents, and which was availed of in the process followed by Messer and employed by defendant. In fact, the only possible original idea which can be ascribed to the Edison patent is that of "printing a duplicate phonographic record by forcing a blank agains "the matrix by its own expansive force when heated, and this is "neither possible with the celluloid blank, nor is it attempted "in the Messer process, wherein the expanding of the blank against "the matrix is entirely due to the fluid pressure supplied to the "interior of the celluloid cylinder. The development of the Messer process is much more in line with the process of the Young "patent, and essentially involves nothing more than the turning in of end flanges on Young's thin celluloid record cylinder "and the introduction of steam and air to the interior of the "resulting flanged cylinder to soften, expand and set it in "contact with the mold. And what possible information is there "to be found in the Edison patent tending to suggest development? "Young tells us to heat the blank until plastic enough to take the "impressions of the matrix. Edison says to subject the blank or "the blank and matrix to a 'heated atmosphere', which is equally "indefinite, and in his original disclosure insists most vehemently that the heating contemplated is solely to expand the blank,

"and not sufficient to alter its hardness or render it plastic.
"Young tells us to press the heated and plastic blank gently into
"intimate contact with the matrix until it receives the exact im-
"print thereof. Edison instructs us to obtain any necessary fur-
"ther expansion with a tapered mandrel, which it is absolutely
"impossible to employ with defendant's thin walled blank, and the
"use of which for exactly the same purpose had already been dis-
"closed by Lioret. And, finally, Young tells us to cool the
"printed record, - which inevitably involves a slight ~~skix~~ shrink-
"ing or collapsing inwardly - sufficient to free it from the matrix,
"and states that this enables it to be cleanly and easily removed
"from the mold, obviously 'by direct longitudinal movement'; while
"Edison simply states the same thing a little more definitely by
"saying, in words copied from Lioret, that the cooling of the
"blank will shrink it so as to free it from the molds, and that
"it may then be removed 'by direct longitudinal movement.'

"There is not one thing which any worker in this art would
"be enabled to accomplish with the Edison patent before him, which
"he would not have been able to accomplish with the Young and
"Lioret patents before him; and there is not one hint or suggest-
"ion in the Edison patent which would be of the slightest use to
"a worker in this art in developing from the Young process to de-
"fendant's process of the Messer patent.

"Q. 30. What degree of heat do you understand to be meant
"by the 'gentle heat' described by Young in his British patent
"of 1894?

"A. Evidently such a heat as will render the celluloid
"cylinder pliable or plastic enough to properly take the impress-
"ion from the matrix. The necessary degree of heat for this ~~pmp~~
"purpose would depend somewhat on the method of heating employed.
"Boiling water will soften celluloid, or a dry heat of somewhat
"less than 300° Fahrenheit will suffice. Either of these tem-
"peratures may be properly called 'a gentle heat', as compared

"with the fierce heat of a flame or furnace, for example, "which would be measured at many hundreds of degrees, running "into the thousands."

Please state whether or not you so testified and whether you have anything to add to your answers to these questions, considering them as now repeated.

A. I did so testify, and wish to be understood as so testifying now, considering these questions as repeated.

I see nothing to add at present to my former answers.

Adjourned until June 6, 1910, , at ten o'clock A.M.

Chicago, June 6, 1910. . Parties met pursuant to adjournment. Present as before.

Q. 22. In answer to Q. 31 of your deposition in the Lambert case you stated that the degree of heat employed by the Lambert Company in its Messer process was from 275° to 290° Fahrenheit, according to the pressure of steam employed. Please state whether or not the same is true of the process used by the present defendant in making its celluloid records.

A. The same thing is true substantially, that is to say, the present defendant softens its blanks by steam at approximately the same pressure and exactly the same temperature as that employed by the Lambert Company, i.e., steam at about 40 pounds of pressure and a temperature slightly less than 300° Fahrenheit.

Q.23. I call your attention to Q. 32 of your deposition in the Lambert case, and your answer thereto, which read as follows:

"Q. 32. Can defendant's process be carried on by the use "of steam alone and without the subsequent introduction of "cold air under pressure?

"A. It cannot, so far as I know. I made several attempts "to print records by the use of steam pressure alone, but the "best results I was able to obtain were so imperfect as to be "useless. For example, I here produce a blank which I subjected "to defendant's printing process, except that I did not apply "the air pressure. This blank is printed in spots, but cannot "be used for reproducing intelligible sounds."

Please state whether or not you so testified, and, if so, whether the same answer applies to the process used by the present defendant company?

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated.

Substantially the same answer applies with regard to the proces carried on by the present defendant. I am unable to produce the blank referred to in my former answer, above quoted, which was marked "Defendant's Exhibit Carter Record No. 4", since this recor has disappeared. I, however, produce a blank which I attempted to print recently in defendants' Albany factory by the use of steam pressure alone, which it will be noted is equally lacking in any record surface capable of producing an intelligible sound. This blank is marked on its interior with the number 102, which I placed on it at the time. In attempting to print it I ~~fxxlxwxx~~ followed the defendants' regular printing process in every particular, except that I did not apply the air after using the steam.

By Mr. Scott: The blank thus produced and identified by the witness is offered in evidence, and the Examiner is requested to mark the same "Defendants' Exhibit Defendants' Blank No. 102 Attempted To Be Printed With Steam Pressure Alone."

Q. 24. In answer to Q. 33 of your deposition in the Lambert case, you stated that the temperature of the compressed air used in the Lambert Company's ~~preparation~~ process was substantially the same as that of the room "except as it is inevitably warmed somewhat by entering the mold through the same inlet pipe which admits the steam, and which is necessarily previously heated by the steam." Please state whether the same is true of the compressed air used by the process carried on by the present defendant company?

A. Precisely the same thing is true. The compressed air is of normal temperature, except as it is warmed by entering the mold through the inlet pipe. The arrangement of the inlet air and steam pipes of defendants' apparatus is the same as it was in the Lambert apparatus, and is substantially the same as the Messer patent discloses.

Q.25. I call your attention to Q. 34 of your deposition in the Lambert case, and your answer thereto, which read as follows:

> "Q. 34. Are the inturned end flanges a necessary feature "of defendant's records.
>
> "A. They are absolutely necessary, being indispensable "to each of the three purposes for which these flanges are "provided, to-wit: They are necessary to supply rigidity "and stiffness to the cylinder, the wall of which is not thick "enough in itself to maintain its shape, as anyone may readily "determine by cutting off the end flanges with a sharp knife "and noticing how readily the plain celluloid cylinder remaining may be distorted. They are indispensable in that they "furnish the sole means of gripping the tapered mandrel of "the phonograph and holding the record centrally thereon. And "they are indispensable as means of sealing the record against "the top and bottom plates in printing. It is possible to "print without these flanges, or without one of them, as the "Exhibits Young Patent Records Nos. 5, 6 and 7 have demonstrated, but it is not practicable to do so as a commercial operation."

Please state whether you so testified, and whether the answer which you there gave applies equally with regard to the necessity of the inturned flanges on the present defendants' records?

A. I did so testify, and the same answer applies, except that, as before stated, the introduction into the present defendants' records of the cylindrical backing furnishes an additional element of strength and stiffness, and acts in place of the flanges as a means of gripping the tapered mandrel of the phonograph when the record is being used.

Q. 26. I call your attention to Q. 35. of your deposition in the Lambert case, and to your answer thereto, which read as follows:

"Q. 35. Please briefly compare claims 2, 3, 4, 5, 9, 10 "and 17 of the Edison patent in suit with the patents of the "prior art, to which you have referred?

"A. Of these claims Nos. 2 and 3 are exactly met in the "British patent to Young. This patent, as compared with claim "2, discloses a method of producing hollow, cylindric phonograms, "which consists in the following steps, to-wit: (1) in obtaining "a mold having a reverse phonogram record on the inner wall of a "cylindric opening; (2) in forming a hollow cylindrical plastic "phonogram within said mold; (3) in releasing the phonogram from "the mold by a radial contraction of the phonograms sufficiently "to entirely clear the surfaces (this inevitably follows the "cooling of the blank, as Defendant's Exhibits Young Patent "Records Nos. 1-7 conclusively demonstrate); and (4) removing "the phonograms from the mold by direct longitudinal movement.

"As compared with claim 3, the Young patent discloses a "method of producing hollow cylindric phonograms, which consists "(1) in obtaining a mold having a reverse phonogram record on "the inner wall of a cylindrical opening; (2) in forming a "hollow cylindric plastic phonogram within said mold; (3) in re-"leasing the phonogram from the mold by a reduction in tempera-"ture sufficient to entirely clear the surfaces; and (4) in re-

"moving the phonogram from the mold by direct longitudinal move-
"ment. As to this latter step, it will be observed that direct
"longitudinal movement is the natural and only feasible movement
"which can occur under the circumstances. As pointed out in co
"nection with Defendant's Exhibits Young Patent Records Nos. 1-7
"the cooling of the celluloid cylinder causes it to contract so
"that it drops straight out from the mold, when the latter is
"lifted, either without being touched at all, as in some cases,
"or as the result of a slight touch or tap on its end.

"With regard to claims 4, 5, 9, ~~and~~ 10 and 17, it is my opi
"ion that these are equally met in substance by the Young patent
"since the process which forms the subject-matter of the claims
"is exactly the same whether carried out with a thick or a thin
"blank, as I have already pointed out, and since the Young paten
"discloses every step of the operation described in each of these
"claims, and can only be possibly distinguished from them by thei
"reference to the thickness of the blank. For example, as compared
"with claim 17, the Young patent discloses a method of producing
"record cylinders for phonographs which consists (1) in first
"forming a record on a cylinder of wax or other relatively soft
"material; (2) in rendering the surface of the wax cylinder elec-
"trically conductive; (3) in electrolytically depositing metal
"thereon forming a matrix; (4) in outwardly expanding under press
"ure within the matrix a cylinder or tube of softened material; an
"(5) in finally removing the cylinder or tubes by direct longitud
"inal movement.

"The Lioret British patent, in my judgment, equally an-
"ticipates, in exact terms, claims 2, 3, 4, 5, 9 and 10. And it
"substantially anticipates claim 17, which differs only in speci-
"fying that the original master cylinder is of wax, as was the
"common practice at the date of the Lioret patent. The Lioret pat
"ent shows a method of producing hollow cylindric phonograms, whic
"consists (1) in obtaining a mold having a reverse phonogram

"record on the inner wall of a substantially cylindrical opening; "(2) in forming a hollow substantially cylindrical elastic phono- "gram within said mold; (3) in releasing the phonogram from the "mold by a radial contraction of the phonogram sufficient to en- "tirely clear the surfaces; and (4) in removing the phonogram fro "the mold by direct longitudinal movement. As to the last of the "steps, I have already pointed out that this direct longitudinal m "ment is perfectly feasible with a record of large diameter, such as 'Defendant's Exhibit Lost Chord Record,' and that in any case "the essential process is the same, whether the record is withdraw "directly endwise or by unscrewing it.

"The same comparison, thus made with claim 2, obviously also "holds as to claim 3, which is simply a repetition of claim 2 in "slightly different language. And it equally holds as to claims "5, 9, 10 and 17, since the celluloid blank of Lioret is obviously "'sufficiently thick to maintain its shape during and after the "act of disengagement from the matrix', even assuming that this "question of the thickness of the blank is entitled to any mater- "ial consideration in connection with the essential process claimed

"As to claim 17, which is differentiated from Lioret in "words by the description of the master record, as of 'wax', it has "already been pointed out at length, as acknowledged by the Edison "specification, that it makes not the slightest difference to the "essential process set forth how or in what manner the matrix is "obtained or from what kind of a master record. And it had also "been pointed out that this exact method of obtaining matrices "from original wax records was well known at the date of the Lioret "patent, having been disclosed in the British patent to Young and "in Edison's earlier patents heretofore referred to, so that the "substitution of wax of steel as a master record was simply the "making use of a well-known equivalent, even assuming that the "character of the master record can be considered as material in "a discussion of a process of subsequently producing duplicate "records.

"In my judgment, therefore, each of the claims Nos. 2, "3, 4, 5, 9, 10 and 17 of the Edison patent in suit is abso-"lutely and completely anticipated in every essential particu-"lar in both the British patent to Young and the British patent "to Lioret; and also in the U. S. patent to Lioret, which differs "from the British patent only in a few details."

Please state whether or not you so testified, and whether you have anything to add at this time to your previous answer?

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated.

I would also add to my former answer that in my judgment these claims fail to disclose any substantial novelty, in view of the prior Edison patents, No. 382,417 of May 8, 1888, and No. 484,582 of October 18, 1892.

The former of these patents describes substantially the same procedure, which these claims recite, as followed in making phonogram blanks, except of course that the mold ~~ix~~ selected is smooth bored, instead of being a record matrix. And this difference I deem to be immaterial, in view of the fact that such record matrices are shown to have been old by patent No. 484,582. I fail to see any difference in method or procedure between expanding a warm plastic blank in a smooth bored mold, and thereafter allowing it to cool and contract so that it can be removed, and expanding the same warm and plastic blank in a record matrix or mold, and then allowing it to similarly cool and contract so that it can be removed. In both cases the result of the expansion is to make the surface of the blank conform to the surface of the mold or matrix: in neither case is the subsequent contraction either a matter of volition on the part of the mechanic or a matter which is in any way dependent on the character of the mold surface, whether a smooth or a record surface. In each case the mold serves the same purpose which molds always serve, i.e. to give to the plastic material the configuration and finish which the interior of the mold presents. In both cases the contraction is inevitable, and is the result of a law of nature which the mechanic could not keep from acting if he would, and in the case of the record matrix the procedure is possible to follow only because the record surface of the matrix is still so essentially a smooth surface, by reason of the infinitesimal character of its surface variations, that the contraction serves to free the molded part from this surface just as though it was absolutely smooth. In both cases also the endwise removal of the molded article occurs as the natural procedure when a one-piece cylindric mold is used, and is rendered feasible by this contraction which has always been recognized in the molding art, and has always been taken advantage of whenever the desirability of casting or forming an article in a non-sectional mold has presented itself, as shown, for example, in the patents to Appelt, Potter, and Day, heretofore referred to.

The difference in the product is not due to any difference in method - any substantial difference between the steps followed in the one case and those followed in the other - but is solely due to the difference in the mold selected - ~~in~~ to the obvious fact that the molded article will conform to its mold and will differ from similar molded articles to whatever extent the molds differ.

Q. 27. In the present case claims 13 and 16 of the Edison patent in suit No. 713,209 have also been declared on. Please state whether or not the conclusions which you have expressed with regard to claims 2, 3, 4, 5, 9, 10 and 17 of this patent obtain as to claims 13 and 16?

A. They do substantially. These claims differ from claims 9 and 10 only in that they particularize more specifically as to the process of making the record matrix. And I cannot see that this makes any difference whatever, in view of the fact that the identical method of making the record matrix, described by this patent and these claims, was previously disclosed and patented in Edison patent 484,582. As I have already pointed out, it makes no difference how this matrix is made, so far as the steps of the subsequent process of printing the blanks are concerned, the patent in suit itself stating, at line 45, of page 1, that -

> "the matrix can be produced by any of the known processes, as, for example, those indicated in my patent No. 484,582 dated October 18, 1892."

Which being the case, I fail to see how anything of importance or substantial novelty can be added to these claims by the mere specific recitation of such particular old and previously patented method of making the record matrix, and the conclusions which I have expressed with regard to the failure of the other claims of the patent to disclose any practical novelty in view of the prior art, therefore apply equally as to claims 13 and 16 also.

Q. 28. What combination, cooperation, or interaction do you find between the particular process chosen for making the record matrix, and the steps which are subsequently followed in using this matrix in the printing of phonograms after the manner set forth in the patent in suit and its claims in issue?

A. None whatever, and I deem it an absurdity to join the two, as in claims 9, 10, 13, 16 and 17, under the pretext of their forming a single process. As a matter of fact, the making of the matrix is an entirely separate, distinct and disconnected process from the printing of the record in the matrix. It may be, and in the case of the defendant company is, carried on in a different factory and in a different city, as I am informed, far from those where the printing of the records is carried on. And the matrix may not only be made by different processes, or as the patent in suit puts it "by any of the known processes", without affecting in any way the subsequent steps of the process of printing the record in the matrix, but the same matrix may be used for producing the printed duplicate by different processes, as, for example, by pouring melted wax into the matrix and allowing it to harden there, after the manner ordinarily followed in casting practice.

Of course it is true that the better and more perfect matrix, the better and more perfect the article molded in the matrix will be, but this is always true of any operation - that the better the tool the more perfect the results obtained by its use. And as well might one include the process of obtaining metal of the requisite purity and quality for the electrolytic deposit, or the process of obtaining the wax, or other material used for the blank, of requisite fineness of grain, plasticity, and ultimate hardness(all of which would go to ~~thexgeneralxresult~~ affect the general result and the ultimate quality of the product) as a component part of the alleged novel process of making the duplicate record or phonogram, as to include the manner of making the mold as the component part of such process.

In my judgment the question of the novelty of the alleged improvement of the patent in suit must be decided without in any way taking into consideration the question of how the record matrix is made, not only because the particular method of making the matrix set forth and claimed in the patent in suit was admittedly old and previously patented in Edison patent No. 484,582, but because of the entire lack of any combination, cooperation, or interaction between the particular process chosen for making the record matrix and the steps which are subsequently followed in using this matrix for the production of duplicate phonograms in the manner set forth in the patent in suit.

Q. 29. I call your attention to your answer to Q. 36 of your deposition in the Lambert case, this question and answer reading as follows:

"Q. 36. Please state whether or not you find defendant's "celluloid records to be made of a material 'sufficiently thick "'to maintain its shape during and after the act of disengagement "from the matrix' within the meaning of this expression as em- "ployed in the Edison patent in suit?

"A. I do not so find. On the contrary, the shape of "defendant's record is maintained by their inturned end "flanges without which the records are likely to become "distorted and misshapen when removed from the matrix."

Please state whether you so testified, and whether or not the same is true of the celluloid records made by the present defendant company?

A. I did so testify, and wish to be understood as so testifying now, considering the question as repeated. In my judgment the same thing is true of the celluloid records made by the present defendant Company, i.e. that they are not of a material "sufficiently thick to maintain its shape during and after the act of disengagement from the matrix." Like the records of the Lambert Company they are shaped so as to be maintained by the inturned end flanges, and further by the inserted backing, which cooperates with the flanges in maintaining the shape of the record.

Q. 30. I call your attention to questions 37 and 38 of your deposition in the Lambert record, and your answers thereto, which read as follows:

"Q. 37. To what extent, if at all, do you find defend- "ant's process of producing duplicate phonographic records to "be identical with the process set forth and claimed in the "Edison patent in suit?

"A. Only to the extent that both are identical with the "prior processes of the Lioret and Young patents. As a whole, "defendant's process and that of the Edison patent in suit "are necessarily substantially different, since the process "described and claimed in the Edison patent in suit will not "and cannot be made to produce defendant's records, and since "the process employed by defendant will not and cannot be made "to produce complainant's records.

"Obviously, the question of resemblances or differences "between two processes cannot be determined by a mere matter "of words. And when neither process is capable of producing "the article for the making of which the other process was "particularly and accurately designed, it necessarily fol-"lows that the two processes are essentially different.

"Q. 38. In your opinion, does defendant, in manufac-"turing its celluloid records, follow the process set forth "in the patent to Lambert 645,920, of March 20, 1900?

"A. It does not. In the first place this Lambert patent, "like the Edison patent in suit and the British patent to "Young, does not set forth any practicable process of manu-"facturing celluloid records. It describes with some elabo-"ration the already well-known method of making a copper matrix "from a wax master record, but it is even more indefinite as "to how the matrix is employed in the manufacture of duplicate "records than are the Edison and Young patents; and in so far "as it gives any details at all, they are different from "any details of defendant's process. In the second place, the "process of this Lambert patent is specifically limited to the "manufacture of records of 'material sufficiently thick to "maintain its shape during and after the act of disengagement "from the matrix,' and, as I have already pointed out, I do "not find defendant's records to be of any such thickness.

Please state whether or not you so testified, and whether your conclusions apply equally to the manufacturing methods of the present defendant Company?

A. I did so testify, and wish to be understood as so testifying now, considering the questions as repeated. I consider also that the conclusions expressed in these answers apply equally as regards the manufacturing methods of the present defendant Company.

Adjourned until Tuesday, June 7, 1910, at 10 o'clock A.M.

Chicago, June 7,1910. Parties met pursuant to adjournment. Present as before.

Q. 31. The questions and answers of the cross-examination and re-direct examination in your deposition in the Lambert case read as follows:

"Cross-Examination by Mr. Dyrenforth.

"X.Q.1. You have referred to certain duplicate phonograph "records which you made in my presence at the defendant's "factory. It is a fact, is it not, that these celluloid "cylinders were prepared for you in advance of your going "to the factory?

"A. Yes.

"X.Q.2. By whom were they prepared?

"A. I do not know. My instructions as to what I "wanted were given to Mr. Philpot.

"X.Q.3. What instructions did you give Mr. Philpot as "to the making of those celluloid cylinders?

"A. I told him that I wanted to see if I could not "make some very thin celluloid records, such as the British "patent to Young evidently contemplated, and that I would "like to have him procure some thin celluloid tubing for the "purpose. He replied that he could not do this, because of "the fact that it was impossible to make celluloid tubing "thinner than that which defendant used for making its stand-"ard indestructible celluloid records - such tubing as that "which 'Defendant's Exhibit Defendant's Finished Blank' is "made of. I then asked him if he could not get some very "thin celluloid in sheet form and cement its edges together "after bending it into the form of a cylinder. To this he "replied that he would endeavor to do so, and later on he telephoned me that he had done so and that the resulting cylinders were "ready for my use .

"X.Q.4. In making these records in my presence, what was the "first thing which you did with the prepared celluloid tube?

"A. The first thing which I personally did was to remove the "tube from the matrix, after it had been printed and had cooled and "contracted sufficiently to permit of its ready removal. The actual "printing operation was carried on by Mr. Philpot himself, with an attendant. This operation, as carried on in our presence, consisted "in first inserting the thin celluloid blank in the matrix; in then "placing the matrix upon the bottom plate of the machine and bringing down the top plate into the upper end of the matrix and against "the blank; in then turning the ~~xtrxx~~ steam into the blank for a few "seconds; and, finally, in turning off the steam and turning on the "air pressure. After the air pressure was turned off the matrix "was lifted from the machine, and I myself attended to the removal "of the printed blank or record from the matrix.

"X.Q. 5. You can recall distinctly, can you not, how the tube "was inserted into the matrix?

"A. I do not remember any noticeable peculiarity about the inserting of the tube into the matrix except that in one or two instances the blank fitted the matrix so tightly that it was difficult to insert and had to be buckled in the act.

"X.Q. 6. Is it not a fact that the blank, before it was "inserted into the matrix, was considerably distorted from its tubular form?

"A. Yes; none of these blanks were of anywhere nearly exact tubular form before being placed in the matrix. The fact that "they were made, as they were, of a piece of sheet celluloid, bent "over until its ends could be joined and cemented, caused all these "blanks to assume an irregular shape, very similar to that which "'Defendant's Exhibit Young Patent Record No. 4' now exhibits.

"X.Q.7. What instructions, if any, did you give Mr. Philpot "as to the cylindrical diameter that these blanks should have?

"A. I do not know that I gave any definite instructions on "this point. I assumed that they would be made as nearly as practi-"cable of the same diameter as defendant's regular blanks, such as "'Defendant's Exhibit Defendant's Finished Blank', and I think they "were intended to be so made. Mr. Philpot informed me, however, that "it was extremely difficult to secure any exact uniformity in the di-"ameter of these thin blanks, which had to be made by bending up a "sheet of celluloid and cementing its edges.

"X.Q. 8. You understand, do you not, that they were formed by "being bent around the mandrel and the edges cemented together?

"A. I do not know how they were formed, but would suppose that "the method of forming them about the mandrel, which you suggest, "would be the most natural one.

"X.Q. 9. Are the regular blanks of the defendant company init-"ially shaped upon a mandrel?

"A. Yes. The rough tubing, as it comes to the factory, is forced over a steam-heated mandrel, which gives it its correctly cyl-"indric shape and a fairly uniform diameter.

"X.Q. 10. Is it not your understanding that the blanks which "you used in the experiments when I was present were formed upon the "same mandrel that the defendant's regular tubes are shaped upon?

"A. No, that is not my understanding, and I would rather sup-"pose that a larger mandrel would have been required, for the exter-"nal diameter of the thin blanks was at least as large, on the aver-"age, as the external diameter of defendant's regular blanks, and "in some cases it appeared to be slightly larger. 'Defendant's Ex-"hibit Young Patent Record No. 4', it will be remembered, was print-"ed by slipping it over one of defendant's regular records.

"X.Q. 11. You have testified, I believe, the amount of clear-"ance that exists between the exterior of the defendant's regular "blank and the inner wall of the matrix, but I should like to have "you state it again at this place?

A. There is considerable variation in this fit, according "to my observation of the regular commercial operation of manufac"turing defendant's record. It appears that the bores of the mat"rices vary slightly in diameter, and also that defendant's finish"ed blanks vary slightly in diameter. So that some blanks are too "large to readily enter some of the matrices, while other blanks "are noticeably smaller than some of the matrices. In practice "I observed that the attendant would take a handful of finished "blanks and walk along the bench where the matrices lay, dropping "the records into the matrices wherever they would fit easily. "If one of the blanks seemed to resist entering the matrix, he "would try another, until he got one small enough to drop into that "matrix, and then would try the temporarily discarded blanks in "other matrices until he found those of large enough bore to read"ily receive the blanks. The looseness of the fit, on the other "hand, did not appear to be considered, and amounted to upwards "of a thirty-second of an inch, I should say, in many cases, with "the small size or two-inch records. The fit of 'Defendant's Ex"hibit Defendant's Finished Blank' in "Defendant's Exhibit Matrix "No. '665' is about a fair sample of the way defendant's blanks ordin"arily fit into the matrices in defendant's regular commercial op"erations of printing these blanks, according to my observations. "With the larger blanks, such as are used for the four and three-"quarter inch record, the fit is even looser, and I am informed "that with defendant's process it is possible to successfully "print one of these larger sized blanks when it is as much as a "quarter of an inch less in diameter than the bore of the matrix"

"X.Q. 12. Am I correct in understanding that in the experi"ments which you tried in my presence you carried out the regular "method of manufacturing employed by the defendant, with the excep"tion that you used blanks of thin celluloid, bent into tubular "form and cemented?

"A. Yes.

"X.Q. 13. In these experiments to what extent is it your understanding that you followed the method of the Young British "patent?

"A. It is my understanding that I followed the British "patent to Young to the fullest extent, except for the imperfec-"tions in my blanks, In doing so, ~~however,~~ however, I carried out "the general directions of the Young patent as to heat and press-"ure, along the line of defendant's process, and by the use of the "improvements of defendant's Messer patent.

"X.Q. 14. Then, I suppose that it is your understanding that "the defendant in its regular operations fully carries out the "method of the Young British patent, using, however, thicker blanks, "flanged inward at the ends and with the addition of what you have "referred to as the improvements of the Messer patent?

"A. Yes, that is my understanding, these additions and im-"provements being essential to a commercially practicable method "of producing celluloid records.

"X.Q. 15. In the experiments which you conducted in my pres-"ence, did you heat the matrix before you inserted the blank, or "cause this to be done?

"A. My recollection is that the matrix was not heated when "the first blank was printed, but in the succeeding printing opera-"tions - - which were carried on with the same matrix -- the ma-"trix was more or less heated by reason of the previous admission "of steam to its interior in the preceding printing operations. "In defendant's regular commercial practice, the matrices never "get cold from the beginning to the end of the day's run of records.

"X.Q. 16. Do you know whether or not the matrices are cold "at the beginning of the day's run, and for the first operations in "defendant's regular work?

"A. I think they are.

"X.Q. 17. Was there not in your experiments a considerable interval "in each instance between the making of the records?

"A. There was an interval of some minutes. In two instances "I remember that we took time to place the newly printed record on "a phonograph in an adjoining apartment, in order to determine "whether or not the printed record thereon was a perfect sound "record.

"X.Q.18. And in one instance the matrix containing the record "was put outside of the window, was it not?

"A. Yes.

"X.Q. 19. And do you recall that it was an extremely cold day?

"A. Yes, It was a very cold day, with the txxx thermometer "in the neighborhood of zero, and it was for this reason that I "placed the matrix on the window-sill outside, in order to thereby "quickly chill the celluloid blank and enable it to be removed.

"X.Q. 20. Please describe briefly how the defendant company "manufactures its matrices?

"A. They take a master record of wax or wax-like mater-"ial, place it in an electro-plating bath, after washing its record "surface with a plumbago composition, which is electrically con-"ductive, and thereby deposit metallic copper around the master "record until the deposit forms a cylinder about a thirty-seond "of an inch thick. The wax record is then removed from the bath "with the copper cylinder around it, and is subsequently removed "from the cylinder, I think by contracting it, although I am not "certain as to this. It might, of course, be melted out, or "broken or dissolved out. The copper cylinder is then placed "within a much larger iron cylinder, and the space between them "is filled up with plaster of Paris, which forms a solid backing "for supporting the copper. I believe also that at some stage of "the operation a very light deposit of nickel is also plated upon "the interior of the matrix to better protect its record surface.

"X.Q. 21. How does the bore of that matrix compare in di-"ameter with the mxxx master record from which it was made?

"A. I should say that the bore of the matrix was of exactly "the same diameter as the master record, at normal temperature.

"X.Q. 22. Then, is the blank of celluloid employed by the "defendant in its regular operations of the same diameter as the "master record, in view of what you have stated concerning the "clearance?

"A. No, it is somewhat smaller.

"X.Q. 23. The Young British patent contains the following "from lines 47 to 50, inclusive:

> "To produce a working record from the said electrode this and its case would be warmed or slightly heated by any convenient means, and within the said electrode would then be placed a very thin hollow cylinder of the same size externally as that of the original wax cylinder upon which the record was first taken."

"The patent goes on to say that the cylinder so inserted "may be celluloid, xylonite, vulcanite, or the like. Does the "defendant in its regular practice follow those directions of the "Young patent?

"A. Substantially, yes. As I have before stated, there "is no exactness of fit necessary or aimed at in defendant's pro-"cess as between its blanks and the matrix. For under the heat "and pressure of the steam and air the blank, even if quite inac-"curately fitted, will be forced to conform exactly to the surface "of the matrix, and this whether the original fit was tight or "loose. The only reason for avoiding a tight fit is to avoid "any possible damage to the record surface of the bore of the ma-"trix which might occur if a tight fitting blank of the hard cellu-"loid could be forced into it.

"Moreover, with any of these processes it is substantially "true that the blank, before being introduced to the matrix, and "the completed record, after being removed from the matrix, are "of the same diameter as the original master record, this being "necessarily so if the newly printed record is to be an exact du-"plicate of the original, as all of these patents, including both "the Young patent and the Edison patent in suit, state it to be, "and as the results of defendant's process prove it to be in substantial fact. This substantial identity in diameter, however, "does not preclude the existence of whatever slight differences "may be required to permit the insertion of the blank in the "matrix, or permit the removal of the printed duplicate from the "matrix without damage to the record surfaces of either the duplicates or the matrix. And where the Young patent states, as you "have quoted, that the celluloid blank is of the same diameter externally as that of the original wax record, it undoubtedly refers to the substantial fact and leaves out of account any such "minute variations as the ready fitting of the blank into the "matrix might involve. Just as the Edison patent in suit, in "describing the duplicate phonographic records produced by its "process, refers to them as 'absolutely identical in every respect "with the original record,' although, as a matter of fact, these "duplicate records will necessarily be slightly smaller in diameter "than the original record.

"X.Q.24. Suppose the celluloid tube of the Young British "patent to be as the patent describes it, that is, 'of the same "size externally as that of the original wax cylinder upon which "the record was first taken,' how would you get it into the matrix "without buckling or collapsing it?

"A. It might be readily done by cooling the celluloid first "so that it would contract sufficiently to readily enter the matrix. "It will be remembered that the depth of the sound groove in a phonographic record is but a few ten-thousandths of an inch deep, "never, I believe, exceeding a thousandth of an inch, so that a "shrinkage of two one-thousandths of an inch in all that would be "required to permit the celluloid cylinder to enter without buckling, even assuming that the exterior diameter of the celluloid "cylinder is precisely the same as that of the original record.

"X.Q. 25. What means would you suggest for thus cooling "and shrinking the celluloid blank?

"A. On a cold day it might be done by sticking it out of "the window, or otherwise, by placing it in an ice chest, or thrusting it into ice water.

"X.Q. 36. Does any other way occur to you, except subjecting "the blank to a temperature below the normal temperature, and thus "shrinking it?

"A. Obviously it might be done in a converse manner by "heating the mold until it expanded sufficiently to receive the "blank.

"X.Q. 27. Why did you not mention this method in your last "answer?

"A. Simply because the other method was the first to "occur to me, and perhaps because I had in mind a statement, which "appears somewhere in the Lambert-Edison Interference Record, from "the mouth of Edison's assistant, Mr. Wurth, to the effect that in "some cases the wax or soap blanks used in the Edison process of the "patent in suit were cooled and contracted for the purpose of rendering them small enough to enter the matrix. On the other hand, "I note that the Young patent refers to the heating of the matrix, which, as above stated, would tend to permit the entrance of the " celluloid cylinder without collapsing, even if made of precisely "the same diameter as the original wax record.

"X.Q. 28. At the time you suggested the shrinking of the "blank by the action of cold, did you not have fully in mind the "fact that the Young patent itself ~~xafafax~~ refers to heating the "matrix?

"A. I did not. The fact temporarily slipped my mind.

"X.Q. 29. Assume the celluloid blank of the Young patent to "be of the same diameter as that of the master record: Assume also "that the bore of the matrix has no taper: Assume also that the "matrix is preliminarily heated to expand the bore to receive the

"the blank: Assume also that the blank is made plastic and pressed
"outward against the matrix, as described in the Young patent: What
"would you do then in order to get the blank out without buckling
"it?

"A. Simply cool the blank, when it would inevitably
"shrink away from the wall of the matrix, so that it could be eas-
"ily withdrawn endwise, without its cylindric shape being in any
"way distorted. This might be done either by letting cold air
"blow through the bore of the record, or by immersing the matrix
"with the record in cold water, or by letting the matrix stand un-
"til both it and the record cooled down to the normal temperature -
"in any case the result would be the same-- that the celluloid cylin-
"der would shrink away from the bore of the matrix so as to be read-
"ily removable therefrom without buckling. And this would be
"equally true whether the bore of the matrix was cylindric or
"slightly tapered , like the bore of defendant's later matrices.

"X.Q. 30. Do you find in the Young patent any suggestion
"of chilling the blank by means of cold air or ice water?

"A. The Young patent simply speaks of cooling the blank
"to enable it to be removed from the matrix. It does not mention
"any particular cooling medium.

"X.Q. 31. Is not the language to which you refer in the Young
"patent, 'and when the said plastic cylinder has cooled, I am en-
"abled,' etc.?

"A. Yes .

"X.Q.32. Giving the usual force to that expression, do you
"understand it to convey any idea of cooling below normal tempera-
"ture?

"A. Not necessarily, although the expression could be used
"with perfect propriety if a cooling below the normal temperature
"were contemplated. As a matter of fact, however, the contrac-
"tion of celluloid is so much greater than that of metals, and par-
"ticularly of copper, and the plastic point of celluloid is so high

"in temperature, that the complete cleavage or separation of the "celluloid from the bore of the matrix will inevitably take place "long before even the normal temperature is reached, so that the "subjecting of the celluloid record or of the matrix and record "to any cooling medium below normal temperature will be in any "case entirely unnecessary, except for the purpose of expediting "the operation.

"X.Q. 33. When the celluloid blank of the Young patent is "pressed ~~shmpx~~ outward against the slightly expanded matrix, is "the diameter of the blank increased?

"A. Yes, it is necessarily increased to the extent of "double the depth of the phonographic record grooves, which are "reproduced in relief on the surface of the matrix, a total amount "of possibly two one-thousandths of an inch.

"X.Q. 34. Suppose the blank to be of the same diameter as "the master record, and suppose the bore of the matrix to be expanded by the application of heat to give a clearance sufficient "to permit the blank to be easily inserted; in that case to what "extent would the diameter of the blank be increased by following "the directions of the Young patent in the manner of pressing it "outward against the matrix?

"A. It must necessarily be increased to the extent of a "radial expansion equal to the depth of the record thread formed in "relief on the bore of the matrix. It is this expansion, or increase in diameter, in fact, which causes the thread to be impressed into the plastic surface of the blank and without such increase "in diameter there could be no impression.

"I assume now that you are not inquiring as to the ultimate diameter of the celluloid record when cooled to normal temperature. "This in every case will be smaller than the normal diameter of the "bore of the matrix.

"X.Q. 35. Is it not a fact that under the conditions of my "last question the increase in the diameter of the blank, when "pressed outward against the wall of the matrix, will be equal to "double the clearance plus the depth of the phonographic record?

"A. Yes. My last answer stated the least possible expansion which could occur, or that which would result ~~with~~ when "the blank exactly fitted into the matrix.

"X.Q.36. Keeping in mind my last two questions for the conditions, and assuming the blank to have been introduced at normal "temperature into the matrix, what diameter will the blank assume "when it cools back to the normal temperature?

"A. A diameter of approximately a thirty-second of an inch "less than the diameter of the master record, in the ordinary two-inch size. In other words, the final diameter will be that due "to the shrinkage of the blank from a temperature of 275° or 300° Fahrenheit, at which it will be in a plastic condition and in intimate contact with the matrix, and consequently of the same diameter as the bore of the matrix, no matter what its diameter was "when introduced to the matrix. And inasmuch as the contraction "of the celluloid from this temperature will be materially greater than the contraction of the copper from this temperature, the "ultimate diameter of the celluloid record, when cooled to normal, "will be appreciably smaller than the ultimate dimmeter of the copper matrix when cooled to normal, and this latter diameter will be "that at which it started, to-wit, the diameter of the master record. "In mentioning a thirty-second of an inch as the difference in "shrinkage between the copper and the celluloid of an ordinary two "inch record, I am going by my observation rather than by any theoretical results. I will, however, figure out the theoretical difference and let you have the result, if you desire me to.

"X.Q. 37. In the course of your description of the operations "conducted by you with thin celluloid cylinders, and which you have "said were conducted in absolute accordance with the Young British "patent, you use these words; 'and in every case, upon being allow-

"ed to cool, the cylinder contracted, collapsed, shrunk, or what-
"ever it may be called, so as to free itself from engagement with
"the bore of the matrix.' The Century Dictionary defines the
"word 'collapse' as follows: 'To fall together, or into ~~any~~ an ir-
"regular mass or flattened form, through loss of firm connection or
"rigidity and support of the parts or loss of the contents, as a
"building through the falling in of its sides, or an inflated blad-
"der from escape of air contained in it'. Do you think this def-
"inition accords with your use of the word?

A. No, and as before stated, I consider the use of the word
"'collapsed', as applied to shrinkage or contraction, as a rather
"loose and inaccurate employment of language. I believe, however,
"that Webster's Dictionary gives a definition of 'collapse' which
"includes contraction or shrinkage.

"X.Q. 38. When a metallic vessel, for example, is subjected
"to heat, it expands, does it not?

"A. Yes.

"X.Q. 39. And this expansion occurs without change of shape
"of the vessel, if the heat is not excessive, does it not?

"A. Usually. I would not want to say that the rule was
"invariable, but it certainly is generally true.

"X.Q. 40. Then when the vessel is allowed to cool it resumes
"its normal dimensions, does it not? In answering this question
""you need not, unless you wish, go into fine distinctions based upon
"the variability of normal temperatures.

"A. Yes.

"X.Q.41. Do you find any definition in Webster's Dictionary
"which would justify you in saying that the vessel 'collapsed' in
"thus resuming its normal size without change of shape?

"A. No.

"X.Q.42. If the resulting celluloid record is of smaller diame-
"ter than the master record, is the reproduction of sound and arti-
"culation from it absolutely the same as the reproduction of sound

"from the master record?

"A. I am unable to say as to whether it is absolutely the same or not. For all practical purposes I think it may be so regarded. The reproduction of sound by any of these records, whether masters or duplicates, is sufficiently imperfect to render it fairly difficult to compare possible slight differences in the extent of the imperfection. It would occur to me also that a slight variation in the speed of the mandrel of the phonograph might be employed to correct any slight difference in the sound reproduction due to the slightly shrunken size of the duplicate record, although I do not understand that any such variation is undertaken in practice.

"X.Q. 43. Theoretically, do you think there would be a difference under the conditions of the last question?

"A. Yes, unless a correction could be made by varying the speed of the mandrel as I suggest. With a smaller record cylinder the surface speed of the record with a given rotary velocity of the mandrel would be less, and this would tend to lower the pitch of all the reproduced tones.

"X.Q.44. Them, theoretically at least, the reproduced record, in order to be absolutely accurate, should be of the same dimensions as the master record; is not that so?

"A. Yes.

"X.Q.45. And, theoretically at least, the more closely that the reproduced record approximates the master record in the matter of dimensions, the more nearly accurate will be the reproduction of sound, is not that correct?

"A. Yes.

"X.Q. 46. At the risk of repetition, please state what the defendant does after shutting off the steam?

"A. The practice is to close the steam valve and immediately open the air valve, so that the air pressure is admitted before the steam already in the record has time to condense and re-

"lieve the record from internal pressure. Simultaneously with the "opening of the air valve, also, a little escape valve or vent is "opened to permit the water of condensation to run out and to per-"mit a sufficient leakage of air to prevent it from becoming unduly "heated. The air pressure is kept on for some little time, the "amount of which is in fact discovered by the time it takes the op-"erator to attend to his other bank of printing machines. For, as "before stated, the practice is to fill up one bank of machines and "turn on the steam in these machines while the matrices are being "removed and replaced in the other bank of machines, and then to "close off the steam pressure, and then to turn on and leave on the "air pressure in the first bank of machines while the top plates are "being brought down and the steam is being turned on in the second "bank. And then, finally, to turn off the air pressure and remove "the matrices of the first bank of machines, and so on in rotation.

"The air having been shut off, after perhaps two or three "minutes, and the matrices having been removed and placed upon the "bench, they are allowed to stand there until they are wanted for "reloading. As before stated, several sets of matrices are employ-"ed for each bank of machines, at least three sets, as I remember, "and each set in turn is allowed to stand and cool while the pre-"viously used sets are being reloaded and replaced in turn in the "machines. Just how long it takes the attendant to get around "to the cooling matrices, I do not remember to have noted, but at "any rate the time is sufficient to permit of a cooling and con-"traction of the printed records within the matrices sufficient "to enable them to be xxxxxx removed from the matrices, without "damaging even the record surface of the matrix or the record sur-"face of the newly printed duplicate. In some cases I observed "that the contraction was sufficient to permit the record to drop "out of the matrix when the latter was lifted. More ordinarily a "slight push on the end of the record is necessary to free it from "the matrix. This operation of removing the records from the

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"matrices is aided by the fact that defendant's matrices have of "late been made with a slightly tapered bore, as before stated. "This taper, however, is imperceptible to the eye, being not much "over a hundredth of an inch in the length of the bore.

"X.Q.47. Do you wish to be understood as saying unreservedly "that in order to permit the record cylinder to be taken longitudin- "ally from the matrix, the defendant does nothing but allow the "record cylinder to cool?

"A. I have described the process exactly as I observed it. "The matrix, with the freshly printed duplicate inside of it, is "placed on the bench and allowed to cool until the record cylin- "der can be readily removed from the mold. It must, of course, be "removed endwise, since there is no other possible way of removing "it. Sometimes, as I have said, the record cylinder contracts so "much that it will drop out of its own accord, if given an opportu- "nity. More ordinarily it is pushed or pulled somewhat to with- "draw it. There is nothing whatever else done to the record or to "the matrix in this operation of removing the record cylinders from "the mold, so far as I have observed or have any reason to believe. "I might say in this connection that I have only observed defend- "ant's commercial process in the manufacture of the smaller or two- "inch records. The only difference with the larger records, how- "ever, would be that with the larger records the shrinkage would "be more marked and they would be more likely to drop out of their "own accord.

"X.Q.48. Do you say unreservedly that according to your obser- "vation, after the record cylinder has cooled, the attendant in the "defendant's process does not, as an additional step, have to col- "lapse it slightly inward in order to remove it cleanly and easily "from the matrix?

"A. I do. I take it that you are using the word 'col- "lapse' here as meaning buckling or distorting. Nothing whatever "of this kind is done, so far as I have observed. The attendant

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"either hooks his finger inside of one of the end flanges of the "record and pulls it out, or pushes in his finger on the end of "the record and forces or permits it to drop out.

"X.Q. 49. In the defendant's operations that you have observ"ed, does the attendant, after the record cylinder has cooled, per"form any act calculated either to buckle or further shrink the cyl"inder (if you desire to put the latter interpretation upon the "word 'collpase') to enable him to take the cylinder from the matrix?

"A. He does not. If the record cylinder offers any ser"ious resistance, he simply waits until it has cooled and contract"ed further, and to the point where it can be easily pushed or pull"ed out.

"X.Q. 50. Then what justification have you for saying that the "method followed in the defendant's factory is absolutely that of "the Young patent, which says that after the cylinder has cooled an "additional act is performed in order that it may be removed from "the matrix?

"A. My justification is this, that the practical physical "operation is the same in the two cases, and is based on precisely "the same physical situation. The so-called 'additional act,' to "which you refer, is obviously as unnecessary to the Young process "as to defendant's process, in view of the actual physical situation "presented alike in both processes, and the reference to it in the "Young specification must either be regarded as a superfluous des"cription of an entirely unnecessary and superfluous operation, or "as the inaccurate description of the necessary and inevitable op"eration, which, under the circumstances, must occur, and cannot be "prevented from occurring. Of these alternatives I prefer the lat"ter.

"As I have before pointed out, the thin celluloid cylinder "constituting the blank of the Young process is absolutely bound "to contract when cooled, by reason of its inherent nature, and is "absolutely bound to contract so much faster and so much more than "the surrounding metal matrix can contract that it must necessarily detach itself from the surface of the matrix. This is true "as a matter of theory, and it is also true as a matter of practice, "as the results obtained with the thin celluloid records with which "I have experimented abundantly demonstrated. As before pointed "out, there is no reason why a very thin celluloid cylinder should "fail to contract away from the surface of the matrix any more than "a thicker one, such as defendant's record, or any more than a noticeably thick one, such as the records described by the Lioret "British patent and the Edison patent in suit. The physical law "which governs the action and causes the shrinking of the record "away from the matrix is the same in the one case as in the other, and, as I have before said, no power on earth can prevent this law "from operating, or the shrinking loose from occurring in either "case, or in one case more than the other.

"Consequently, notwithstanding the peculiar language used "by the Young patent in describing the operation of removing the "celluloid record from the matrix, the physical situation and the "essential operation is and must necessarily be the same with the "Young process as with defendant's, and no one practising the Young "process could possibly fail to discover that the celluloid record "would come away both clearly and easily from the matrix when allowed to cool, without any further collapsing or shrinking but that "which the cooling of the celluloid would inevitably bring about, "just as it does in defendant's process. A patent specification is "more than mere words, and where the fundamental actions of a process are clearly stated, the inevitable result of these actions "and of the physical situation which they set up cannot be ignored, "simply because some portion of the language of the specification "happens to be loose enough or inaccurate enough to possibly describe an additional act unnecessary to the essential process, and "which, if enacted at all, would be as useless as would be the use "of the teeth in helping to pull a nail, where a claw hammer was "specifically supplied for the purpose.

"X.Q. 51. Do you still insist, Mr.Carter, that in the practical operation which you saw, as you have testified, the defendant absolutely followed the directions of the Young British patent?

"A. I do.

"X.Q.52. In these operations did the operator insert into the "matrix a celluloid blank 'of the same size externally as that of "the original wax cylinder upon which the record was first taken'? "Please answer this question with due regard to the force of the "word 'absolutely' in the last question, and by 'yes' or 'no,' if "you can?

"A. I have no means of knowing the absolutely exact diameter of the blanks used in the operation involved in defendant's "process as I observed it, and, as I have repeatedly before stated, "these blanks vary more or less in ~~xix~~ diameter, as do also the "matrices. Furthermore, there probably was never a celluloid "blank made of absolutely the same diameter throughout its length, "to say nothing of the multiplicity of celluloid blanks being of absolutely the same diameter as each other, or as any given master "record. From my observation of defendant's process, as practised "and carried out, I should say there was no doubt but what in some "cases the celluloid blank was as large in diameter as the original wax or master record, although on an average they are undoubtedly slightly smaller, but still of substantially the same diameter. "To the best of my knowledge, therefore, I would answer your question as follows: Yes, in some cases. Practically so in all cases.

"X.Q. 53. In these operations did the operator have to expand "the matrix by heat to enable him to insert the blank?

"A. During the entire course of the operations observed by me "in watching the practical carrying on of defendant's process of "manufacture, the matrices were very noticeably heated and were "consequently correspondingly expanded, and this is necessarily the "case, except possibly at the beginning of the day's or half day's "run. For the matrices do not have time to cool down to normal "temperature after the printing operation once begins.

"X.Q.54. You have not answered the question, Mr. Carter, as "you will readily see if you will read it over. Please do so, and "then answer it specifically?

"A. If you are intending to inquire as to whether the warming or heating of the matrices was a necessary and inevitable incident of defendant's process, practised for the purpose of enabling "the blanks to be inserted because of the expanded condition of the "matrices, my answer is that I do not so understand. The fact is, "however, that in defendant's process, as regularly practiced, the "matrices are heated and are expanded at the time the blanks are "inserted in them, and undoubtedly in some instances the insertion "of a particular blank in a particular matrix takes place because "the matrix is heated and is expanded, where it would not take place "if the matrix were not heated and were consequently smaller in diameter.

"X.Q. 55. Have you ever made any attempts to practice the "method of making phonograph duplicates which is described in the "Lioret British patent?

"A. I have never made any attempt to use a matrix made "from a threaded steel cylinder, but otherwise the process employed "in making 'Defendant's Exhibit Carter Record No. 1' and 'Defendant's Exhibit Carter Record No. 2' differs only from the process "described by Lioret in that hot air, instead of hot water, was used for heating the blank?

"X.Q. 56. In practicing the Lioret method, how would you remove the electro-plated negative from the steel master record?

"A. By expanding the negative, or what Lioret calls "his 'galvano plastic mold', by heat until it was enough larger "than the steel matrix to enable them to be unscrewed. This operation is described in lines 92-97 of page 2 of the American "patent to Lioret, or, as I suggested in my direct examination, by "dissolving out the steel master record by the use of acids, which "would attack the steel, and not the copper.

"X.Q.57. Does the Lioret British patent say anything about "dissolving the master record by acids?

"A. It does not.

"X.Q. 58. Does the Lioret British patent say anything about "unscrewing the galvano-plastic mold to remove it from the master "record?

"A. No.

"X.Q.59. In practicing its full method of producing record "cylinders for phonographs, does the defendant first form, or pro"cure already formed, a record on a cylinder of wax or other relat"ively soft material?

A. Yes.

"X.Q. 60.Does the defendant then render the surface of the "wax cylinder electrically conductive, and electrolytically deposit "metal thereon, forming a matrix?

"A. Yes.

"X.Q. 61. Does it then outwardly expand under pressure within "the matrix a cylinder or tube of softened material, sufficiently "thick to maintain its shape during and after the act of disengage"ment from the matrix?

"A. No.

"X.Q.62. Does it finally remove the cylinder or tube by direct "longitudinal movement?

"A. Yes.

"X.Q.63.Please repeat, as briefly as you can, your reasons for "saying that the defendant does not employ the step of outwardly "expanding under pressure within the matrix a cylinder or tube of "softened material sufficiently thick to maintain its shape during "and after the act of disengagement from the matrix?

"A. Because the ~~cylinderx~~ celluloid cylinder employed "for defendant's blank is so thin that it requires to be flanged "in at its end in order to give it that stiffness and rigidity necessary to properly maintain its shape after its removal from the "mold.

"X.Q. 64. Do you find any instance in the art, prior to "the Edison application for the patent in suit, of a process for "duplicating ordinary phonographic records by first constructing "a matrix from an original or master record, by then introducing "a non-collapsible blank therein, by then expanding the blank in "the presence of heat into engagement with the matrix to take an "impression therefrom, by then cooling the resulting duplicate to "cause it to shrink sufficiently to clear the engaging surfaces, "and, finally, removing the duplicate by direct longitudinal movement?

"A. Yes, the British patent to Lioret discloses this "exact process, unless a distinction is to be drawn on the word "'ordinary', as applied to the phonographic records duplicated. "The Lioret British patent discloses a process for duplicating phonographic records, by first constructing a matrix from an original "or master record, by then introducing a non-collapsible blank therein, by then expanding the blank in the presence of heat into engagement with the matrix to take an impression thereof, and by "then cooling the resulting duplicate sufficiently to cause it to "shrink and sufficiently to clear the engaging surfaces and enable "it to be easily withdrawn from the mold. And, as before pointed "out, this withdrawal from the mold may take place in the Lioret "process 'by direct longitudinal movement,' if the thread is sufficiently fine and the record of sufficient diameter.

"The Lioret process, it is true, is specifically described "as for the purpose of duplicating screw-threaded steel records, "and does not mention wax phonographic records, more properly included by the word 'ordinary'. Obviously, however, this process "is equally as applicable to the duplication of any other cylindric "phonographic record as Lioret's screw-threaded steel record, if "so desired, its real duplicating operation, specifically described "in your question as consisting of the several steps mentioned there "in being unaffected by the application of the process to the du-"plication of wax master records, and the construction of matrices "from wax master records, and such as your question describes, being "at the time of Lioret's patent fully disclosed to the world and "well understood by skilled workers in this art.

"X.Q. 65. As illustrated in the drawing of the Lioret Brit-"ish patent, what is the approximate ratio between the depth of "the spiral thread and the depth of the phonographic record en-"graved upon the apex of the thread?

"A. There is nothing which enables me to give any very "definite answer to this question. I take it that in Figures 1 "to 8 of the Lioret drawings, the thread is very greatly exaggerat-"ed for the purpose of rendering the illustration clear. Probably "Figure 10 more correctly shows the real size of the teeth, as they "would appear in comparison with the diameter of the celluloid rec-"ord, and in this Figure they are shown very shallow, about a sixty-"fourth of an inch in depth, I should judge. In any case, however, "the depth of the sound indentations engraved upon the apex of the "thread would be very much less, probably not a tenth part as deep, "at the maximum, and perhaps not a hundredth part as deep at the "minimum. In saying this I am assuming that these sound indenta-"tions would be no deeper than those which occur in a wax master "record, which I understand to run from one one-thousandth ~~of~~ to "one ten-thousandth of an inch in depth.

Re-Direct Examination by Mr. Sheridan.

"R.D.Q.1. Does it make any difference with defendant's process "whether or not the matrix is warmed preliminary to the blank print-"ing operation?

"A. No substantial difference. If the matrix was cold "to start on, it simply requires a longer application of the steam "in order to ensure the necessary plasticity of the celluloid, "which is pressed outwardly against the surface of the matrix, "and which will tend to be kept cool thereby until the surface "of the matrix warms up.

"R.D.Q. 2. In your answer to X.Q. 15 you stated that the "matrix was not heated prior to the printing of 'Defendant's Ex-"hibit Young Patent Record No. 8.' Have you printed any ~~thin~~ sim-"ilar thin celluloid records after intentionally heating the matrix, "so that it was hot when the blank was inserted, and if so, with "what difference in result, if any?

"A. The thin celluloid record which I here produce and "have marked 'Defendant's Exhibit Young Patent Record No. 8' was "printed by me, or under my direction, this morning in the matrix "which I also here produce and have marked 'Defendant's Exhibit "Matrix 886 A'. In printing this record with this matrix I follow-"ed defendant's regular process, exactly as I did in printing the "thin celluloid records which I have previously introduced, except "that I heated up the matrix before introducing the blank. I heat-"ed the matrix until its interior was too hot to bear my finger on "it, then inserted the blank, and it went through the defendant's "regular printing process, first turning on the steam to soften the "blank, and then turning on the air to cool it and set it under "pressure. I left the air pressure on about three minutes, and "when I removed the matrix from the printing machine, the blank had "already shrunk until substantially free from the surface of the "matrix, so that by hooking my finger into its flanged end I was "able to withdraw it from the matrix without any noticeable resist-"ance, and without distorting or changing the shape of the blank in "the least.

"So far as I was able to see, there was no noticeable dif-"ference between the results obtained in this case and the results "obtained in the other cases, where there was no previous heating "of the mold. I might also state that this matrix No. 886 A has "no taper."

Please state whether you so testified, and whether or not you wish to add anything to this testimony at this time.

A. I did so testify, and have nothing to add to my former answers, except to say that I am unable at this time to produce the exhibit records and matrices referred to. These exhibits were introduced and used in evidence in the Lambert case, but have since disappeared, and I have been unable to locate them.

Adjourned until Saturday, June 11, 1910, at ten o'clock A.M.

Chicago, June 11, 1910. Parties met pursuant to adjournment. Present as before.

Q. 32. In reply to several of the questions put to you upon direct examination you stated that you have been enable to find the physical exhibits forming part of the record in the suit of the National Phonograph Company against the Lambert Company. Will you please state whether anything has occurred to change this statement made by you?

A. Yes. Since I so testified a further search among the records of the Clerk's office of the Court of Appeals for the Seventh Circuit has disclosed ~~the existence~~ that most, if not all, of these original exhibits are still in existence, and by order of Court I have been permitted to withdraw these original exhibits in the case of National Phonograph Company vs. Lambert Company from the Clerk's files, and I here produce them. For certainty of identification I will now list off the exhibits referred to, and which I here produce.

Four thin walled celluloid cylinders, offered in evidence on page 174 of the appeal record in National Phonograph Company vs. Lambert and identified, respectively, as "Defendant's Exhibit Young Patent Record No. 1", "Defendant's Exhibit Young Patent Record No. 2", "Defendant's Exhibit Young Patent Record No. 3", and "Defendant's Exhibit Young Patent Record No. 4".

Four other thin walled celluloid cylinders, identified, respectively, as "Defendant's Exhibit Young Patent Record No. 5", "Defendant's Exhibit Young Patent Record No. 6", "Defendant's Exhibit Young Patent Record No. 7", and "Defendant's Exhibit Young Patent Record No. 8". Of these Nos. 5, 6 and 7 are referred to as introduced in evidence on page 190 of the appeal record. No. 8 is referred to as introduced in evidence on page 236 of the appeal record.

Three thick-walled celluloid records or cylinders, referred to on pages 195 and 196 of the appeal record and identified, respectively, as "Defendant's Exhibit Carter Record No. 1" "Defendant's Exhibit Carter Record No. 2", and "Defendant's Exhibit Carter Record No. 3".

Also one ordinary Lambert record blank, identified as "Defendant's Exhibit Carter Record No. 4"and introduced on page 202 of the appeal record.

Two Lambert blanks, identified, respectively, as "Defendant's Exhibit Defendant's Rough Blank" and "Defendant's Exhibit Defendant's Finished Blank", referred to and introduced in evidence on pages 187 and 188 of the appeal record.

Also one Lambert record, identified as "Defendant's Exhibit Defendant's Finished Record, Uncle Josh in New York", referred to and introduced in evidence on page 188 of the appeal record.

Two distorted blanks, identified, respectively, as "Defendant's Exhibit Defendant's Finished Blank Edison Processed No. 1", and "Defendant's Exhibit Defendant's Finished Blank Edison Processed No. 2", referred to and introduced in evidence on pages 194 and 195 of the appeal record in the Lambert case.

One four inch Lambert record and matrix, identified as "Defendant's Exhibit Lost Chord Record and Matrix", referred to and introduced in evidence on page 180 of the appeal record.

Three other matrices, identified, respectively, as "Defendant's Exhibit Matrix No. 665" referred to and introduced in evidence on page 190 of the appeal record, "Defendant's Exhibit Matrix No. 886^{A}", referred to and introduced in evidence at page 236 of the appeal record, and "Defendant's Exhibit Matrix No. 879^{A} , referred to and introduced in evidence at page 195 of the appeal record .

Also one mutilated Edison soap blank, identified as

"Defendant's Exhibit Edison Soap Cylinder Injured by Lambert Process", referred to and introduced in evidence at page 192 of the appeal record.

Also a number of fragments of ~~the~~ an Edison soap blank, identified and introduced in evidence at page 192 of the appeal record.

These exhibits are all identified by the original tags attached to them when introduced in evidence in the former case of National Phonograph Company vs. Lambert Company, but independently of such identification I may say that my recollection of these exhibits corresponds precisely with their showing.

The exhibits referred to in the last preceding answer are introduced in evidence, and each of them designated by the title given to them in the prior suit referred to, said title in each instance being preceded by the words "Defendant's Exhibit".

Q. 33. I hand you a matrix marked "3012 H" and a record similarly marked and entitled "Minstrels, Carolina Minstrels No. 1" and ask whether you can identify this matrix and record and what you know about them?

A. This record is one which was printed in my presence at the factory of the Indestructible Phonographic Record Company in Albany. It was printed in the matrix No. 3012 H. After the record was printed I carried both the record and matrix away with me in order to produce them for this examination.

Q. 34. State whether you took any part whatever in the making of the record just handed to you?

A. Yes, I selected the blank, and personally thrust it into the matrix. I then handed the matrix, with the blank inside of it, over to the workman, who printed it in my presence.

Q. 35. Please state with what degree of closeness the blank fitted the matrix when you placed the blank therein prior to the printing operation?

A. It fitted tightly - so tightly that I was obliged to strike the blank forcibly with my hand in order to drive it fully into the matrix. It fitted very much more tightly than was ordinarily the case in the practice of the company. Ordinarily blanks are selected for each particular matrix which will slip loosely into the matrix, since a tight-fitting blank, such as this one was, will scratch the matrix and injure it.

My object in selecting a tight-fitting blank - one which had to be driven in by repeated blows - was to determine, if possible, whether the printed record, when it was finally taken from the matrix, was of the same diameter as the blank was before being printed. From the fact, which is obvious on inspection, that this printed record fits quite loosely within the matrix, I concluded that the printed ~~blank~~ record contracted to a smaller diameter than the diameter of the blank introduced into the matrix.

In other words, I found by this test that the operation of expanding the heated blank into intimate contact with the matrix, with the resultant contraction occurring when the pressure was released and the ~~blank~~ record cooled, reduced the diameter of the record somewhat as compared with its diameter when introduced as a blank into the matrix.

Q. 36. When a physical object is expanded by heat and then cooled to its original temperature, can you state whether its dimensions after cooling are ordinarily the same or different from its dimensions before the heating operation?

A. The general law is that an object when cooled after heating will resume the same dimensions that it had before being heated, assuming that it is cooled to the same temperature, and avoiding such heating as will cause the object to melt down or become materially distorted.

Q. 37. From your observation and your experimenting with the process of the defendant company at its Albany factory, can you state whether the softening effect of the heat imparted to the celluloid by the steam used in the printing operation and the pressure of the steam and air used would be sufficient to impress the phonographic indentations upon the matrix into the celluloid independently of such expansion of the celluloid as results from the heat imparted thereto, or whether, on the contrary, the heat expansion is necessary to effect the printing operation?

A. I don't think there is any question but what the printing or impressing of the phonographic indentations upon the celluloid blank is solely due to the softening of the celluloid by the steam and to the pressure of the steam and air, and is not due at all to any expansion of the celluloid cylinder due to heating.

The amount which such a celluloid cylinder will expand by reason of its temperature increase alone is too small to fill the space which normally exists between the blank and matrix, and I have found that it is impossible to obtain any noticeable impression of the matrix indentations upon the surface of the blank, even where the blank is fitted to the cylinder much more closely than is the case in the commercial practice of the defendant company, if independent pressure is not employed to expand the heated blank.

In this latter statement I am speaking of my experience with the thin celluloid blanks regularly employed by the defendant company, and such as were previously employed by the Lambert Company. As to whether it would be possible, as a laboratory experiment, to make thick celluloid blanks accurately fitted to the matrix, and to so treat them as to impress the phonographic record upon the surface of the blank by expansion due to heat alone, I am unable to state, but I am fully satisfied that it is impossible to do so commercially, and that it is impossible to do so with the thin blanks used commercially by the defendant company.

Q. 38. Referring to the matrix marked"3012 H"and the record made therefrom marked "3012 Carolina Minstrels", I notice that when said record is introduced into the matrix by first inserting the end of the record having the narrow unmarked flange,the record fits considerably more tightly than when it is inserted by first entering the end thereof having the wide lettered flange. Will you explain, if you can, why this is so?

A. This is due to the fact that the matrix is slightly tapered,and consequently makes the record slightly tapered, so that when the unmarked flange of the record is thrust into the bore of the matrix, it amounts to an attempt to introduce the large end of a tapered plug into the small end of a tapered bore,which the plug is supposed to fit.

It will also be noted that the small unmarked flange of the record has been pushed over outwardly by the heat and pressure so as to form a slight rim of larger diameter than the rest of the record cylinder. This rim also tends to make the unmarked end of the record bind in the matrix when the record is thrus in with this end foremost.

Q. 39. Are you acquainted with any theory accounting for the fact whicl you have mentioned,that the Carolina Minstrels record fits matrix No. 3012 H more loosely now, after being printed, than did the blank from which said record was made?

A. The employees of the defendant company accounted for this by assuming that the celluloid cylinder, when heated and allowed to cool freely, tends to resume its original dimension, the diameter which it had before being passed over the heated mandrel.

It will be remembered that the celluloid comes to the factory in rough tubular form, and that one of the first steps in defendant's process is to force the tubes of celluloid over a heated mandrel so as to give them a uniform diameter and smooth cylindric shape. In so doing, the diameter of the tube is inevitably slightly increased - the tube is somewhat stretched - and it is thought that internal stresses result, which caus the blanks, when subsequently heated and allowed to cool in the printing operation, to again contract to more nearly its original diameter.

This explanation appeals to me as a reasonable one, and would explain why it is that the record, when it contracts to its final shape after being printed, is actually of less diameter than the blank introduced to the matrix to make the record.

A certified copy of the transcript of record in the United States Circuit Court of Appeals for the Seventh Circuit in Appeal No. 1154, National Phonograph Company vs. Lambert Company, is introduced in evidence and designated "Defendants' Exhibit Transcript of Record".

A certified copy of the mandate and bill of costs in National Phonograph Company vs. Lambert Company, in Cause No. 1154, is introduced in evidence and designated "Defendants' Exhibit Mandate in Lambert Case".

Objected to as incompetent, irrelevant and immaterial, being a record and decree in a controversy to which the defendants herein were neither parties nor privies. Further objected to as embodying secondary and hearsay, and not primary or the best evidence, and further because no proper foundation has been laid for its introduction. This objection to apply to both the documents offered.

A certified copy of the file wrapper and contents in the matter of the Letters Patent of Thomas A. Edison No. 713,209, this being the patent in suit, is introduced in evidence and designated "Defendants' Exhibit File Wrapper and Contents of Patent in Suit."

A certified copy of the records of the United States Patent Office in the matter of Interference No. 20,534, Lambert vs. Edison, said interference having involved the application upon which the Edison patent in suit was granted, and the same is marked "Defendants' Exhibit Interference Record".

This exhibit is objected to as incompetent, irrelevant and immaterial, being a record of a controversy to which the defendants herein were neither parties nor privies. It is further objected to as embodying secondary and hearsay, and not primary or the best evidence, and further because no proper foundation has been laid for its introduction.

A certified copy of the opinion of the United States Circuit Court of Appeals for the Seventh Circuit in Cause No. 1154, National Phonograph Company vs. Lambert Company, is introduced in evidence and designated "Defendants' Exhibit Decision of Court of Appeals".

Objected to as incompetent, irrelevant and immaterial, and as relating to a controversy to which the defendants herein were neither parties nor privies.

Counsel for Defendants also offers in evidence certified copies of the following assignments, and requests the Notary to designate them as -

"Defendants' Exhibit Certified Copy of Assignment of Patent 643,418 to Thomas B. Lambert."

"Defendants' Exhibit Certified Copy of Assignment of Patent 643,419 to Thomas B. Lambert."

"Defendant's Exhibit Certified Copy of Assignment of Patent 645,920 to Thomas B. Lambert."

"Defendants' Exhibit Certified Copy of Assignment of

Patent 664,223, to Thomas B. Lambert".

"Defendants' Exhibit Certified Copy of Assignment of Patent 742,454 to Thomas B. Lambert".

"Defendants' Exhibit Certified Copy of Assignment of Patent 742,455 to Thomas B. Lambert".

"Defendants' Exhibit Certified Copy of Assignment of Patent 705,772 to William F. Messer."

"Defendants' Exhibit Certified Copy of Assignment of Patent 528,273 to Henri J. Lioret".

Objected to as incompetent, irrelevant and immaterial, as secondary evidence, and as not properly proven.

Defendants' Counsel offers in evidence the following United States and foreign patents considered by the witness, and requests the Notary to designate each of them as "Defendants' Exhibit" followed by the number, name and date thereof:

U. S. Patents.

No. 303,970,	J. Appelt,	August 26, 1884;
" 382,417,	T. A. Edison,	May 8, 1888;
" 434,294,	J. A. Potter,	August 12, 1890:
" 484,582,	T. A. Edison,	October 18, 1892;
" 526,147,	T. A. Edison,	September 18, 1894;
" 528,273,	H. J. Lioret,	October 30, 1894;
" 563,572,	B. Day,	July 7, 1896;
" 645,920,	T. B. Lambert,	March 20, 1900;
" 705,772,	W. F. Messer,	July 29, 1902.

British Patents.

No. 23,366,	H. J. Lioret,	of 1893;
" 1,478,	J. L. Young,	of 1894.

Objected to as incompetent, irrelevant and immaterial, as secondary evidence, and as not properly proven.

The matrix marked "3012 H", considered by the witness, is introduced in evidence, and the Notary is requested to mark the same "Defendants' Exhibit Matrix 3012 H".

The record entitled "Carolina Minstrels", made from matrix 3012 H. is introduced in evidence, and the Notary is requested to mark the same "Defendants' Exhibit Record 3012 H".

Objected to as incompetent, irrelevant and immaterial, as secondary evidence, and as not properly proven.

Cross-Examination Waived.

Henry Carter.

I, Annie C. Courtenay, a Notary Public in and for the County of Cook, in the State aforesaid, and Special Examiner by agreement, hereby certify that all the proceedings aforesaid were had as stated in the cause named in the caption hereto; that on the 23rd day of May, 1910, and subsequent days mentioned in the foregoing depositions, I was attended by Mr. Melville Church, counsel for complainants, and by Messrs. Thomas F. Sheridan and Walter A. Scott, counsel for defendants, and by the witnesses, Messrs. Philpot, Snowden and Carter; that before giving their depositions the said witnesses were by me duly sworn to testify the truth, the whole truth, and nothing but the truth in said cause, and that their depositions were taken down by me in typewriting from their statements and afterwards read over and subscribed by them as and for their depositions in said cause; and that I am not related to or of counsel for either of said parties, or in any way interested in the result of said suit.

In Testimony Whereof I have hereunto set my hand and affixed my notarial seal this 16th day of, June, 1910.

Annie C. Courtenay
Notary Public for Cook County.

At a stated term of the United
States District Court for the
Northern District of New York,
held in the U. S. Court Rooms in
the City of Syracuse, County of
Onondaga and State of New York,
this 1st day of April, 1913.

Present: Honorable George W. Ray, U. S. District Judge.

NEW JERSEY PATENT COMPANY and)
NATIONAL PHONOGRAPH COMPANY,)
Complainants)
)
vs.)
)
GEORGE G. SNOWDEN, JAMES H.) In Equity No. 7240.
SNOWDEN and HENRY McSWEENEY,)
doing business as a partner-) On Letters Patent
ship under the name and style) No. 713,209.
of the INDESTRUCTIBLE)
PHONOGRAPHIC RECORD COMPANY,)
Defendants.)

O R D E R .

A stipulation signed by Counsel for the parties hereto having been filed in this cause, in which stipulation said parties have agreed and stipulated that an order may be entered dropping this cause from the trial calendar in accordance with the provisions of Rule 57 of the Equity Rules, and it appearing that all costs heretofore incurred have been paid, It is

ORDERED that this cause be and it is hereby on this 1st day of April, 1913, dropped from the trial calendar subject to reinstatement within one year from this date upon application to the Court by either party.

Geo. W. Ray

U. S. District Judge.

NORTHERN DISTRICT OF NEW YORK.

NEW JERSEY PATENT COMPANY and
NATIONAL PHONOGRAPH COMPANY,
Complainants

vs.

GEORGE G. SNOWDEN, JAMES H. SNOWDEN and HENRY McSWEENEY, doing business as a partnership under the name and style of the INDESTRUCTIBLE PHONOGRAPHIC RECORD COMPANY,
Defendants.

In Equity

On Letters Patent
No. 713,209.

STIPULATION.

It is hereby stipulated and agreed by and between the parties hereto by their respective counsel that an order may be entered in the cause under Rule 57 of the Rules of Practice for the Courts of Equity promulgated by the Supreme Court of the United States November 4, 1912, dropping the case from the trial calendar subject to reinstatement within one year upon application to the Court by either party.

NEW JERSEY PATENT COMPANY and
NATIONAL PHONOGRAPH COMPANY
By Louis Hicks
Of Counsel.

GEORGE G. SNOWDEN,
JAMES H. SNOWDEN,
HENRY McSWEENEY,
By Thomas F. Sheridan
Of Counsel.

Dated:
March 29, 1913.